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COMMERCIAL CAR JOURNAL

THE MAGAZINE FOR FLEET OPERATORS

OCTOBER 1941

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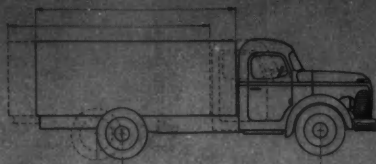
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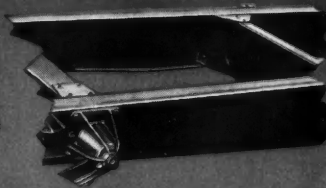
INTER-
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MECHANICAL UNITS



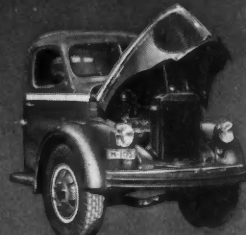
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COMMERCIAL CAR JOURNAL

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OCTOBER, 1941

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TEXACO

COMMERCIAL CAR JOURNAL

THE MAGAZINE FOR FLEET OPERATORS

Vol. LXII

OCTOBER, 1941

No. 2

AS predicted here last month, the Office of Production Management came through—just before the effective date of Sept. 1—with an A-3 preference rating and a limitation of production order covering medium and heavy trucks, trailers, bodies and replacement parts.

Our prediction differed from the orders only in that, at the last moment, OPM made a change in definitions. All the conversations of truck producers and OPM officials had, up to the issuance of the orders, termed a medium truck as one with a rated capacity of $1\frac{1}{2}$ tons. All trucks above that rated capacity were termed heavy trucks.

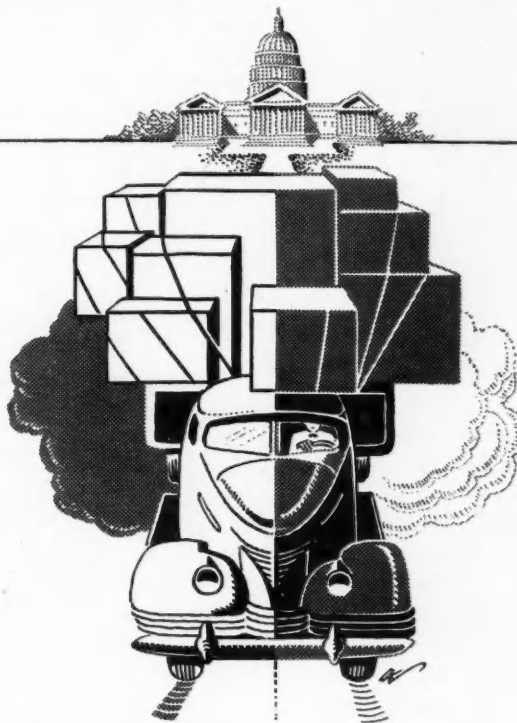
The official definition of a medium truck is now "a complete motor truck or truck-tractor of a rated capacity (as advertised by the Producer prior to Aug. 1, 1941) of $1\frac{1}{2}$ tons or more, but less than 3 tons, or the chassis, body or cab therefore."

All trucks rated at 3 tons and over are heavy trucks.

Production of heavy trucks is unrestricted for the period Sept. 1 to Nov. 30. Production of medium trucks, trailers (5 tons and over) and of replacement parts for such trucks and trailers for civilian use may not be in excess of 50 per cent of the total produced during the first six months of 1941. This latter restriction does not apply to orders placed by government authorities for specific defense purposes.

There has been no change in the estimate of total trucks needed. OPM continues to say that "assistance being extended to truck manufacturers is based on indications that 1,189,000 trucks, approximately 200,000 more than the output of the model year ending July 31, will be required during the new model year that began Aug. 1."

The 1,189,000 includes light trucks under $1\frac{1}{2}$ tons and embraces the estimated needs of the army, lease-lend, export and domestic civilian users.



WASHINGTON OVERLOAD

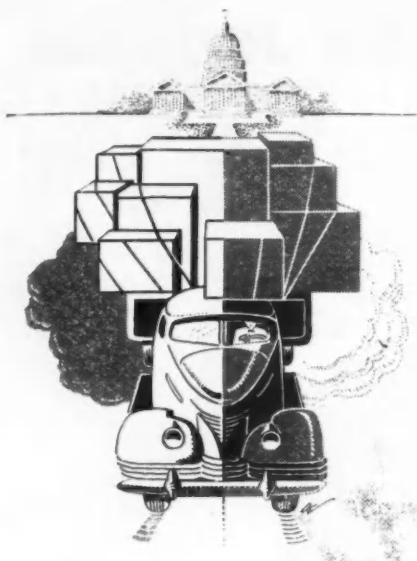
Medium and heavy trucks, trailers, bodies and parts get A-3 rating . . . No preference rating for light trucks . . . All truck repair parts on priority . . . Certain truck users get parts priority . . . Preference ratings now mandatory . . . Yardstick for makers on interchangeable parts . . . Separate Army motor transport corps? . . . Mystery: What became of truck consultants? . . . Tax bill doesn't slight fleets

by **GEORGE T. HOOK**

Editor, Commercial Car Journal

It does not, however, include Canadian production. Of this total 700,000 trucks of all kinds are expected to be available to domestic civilian users. This would be 50,000 more than the 650,000 new trucks registered during the last model year.

The effect of the new definitions on truck production in the medium and heavy classifications cannot be analyzed. The complicating factor, if you have not thought of it before, is the spread-rating practice of many truck manufacturers. There must be



WASHINGTON OVERLOAD

has been to give light truck production a better break than passenger cars. While cars have been curtailed 26½ per cent for the months of August, September, October and November, light trucks for non-military purposes have been cut only 9 per cent for the same period. This means that about 87,000 light trucks may be produced for civilian use compared with 96,000 during the same period last year. Exact quotas by companies will be worked out.

For the full model year OPM speaks of a probable light truck production for civilian use of 261,000 units. Compared with the 370,000 produced in the last model year, this would represent a 30 per cent reduction. (Passenger car output cuts are expected to average around 54 per cent for the model year.) What that adds up to is that there will be 109,000 fewer trucks to go around. If in the scramble farmers, public utilities and other users that consider themselves entitled to preferential treatment fail to have their requirements filled, there may be a squawk that will cause the Priorities Division of OPM to do something.

All Truck Repair Parts on Priority

The manufacture of replacement parts for all kinds of trucks and for

passenger cars is now on a preferential basis as to materials.

An A-3 priority on materials has been given to manufacturers of parts for medium and heavy trucks and trailers of 5 tons or more capacity.

An A-10 priority has been given to manufacturers of parts for light trucks and passenger cars.

Production of repair parts has not been restricted. In fact an increase over the production during the first half of this year has been sanctioned. Permissible production for the remainder of this year is on the following basis:

Parts enjoying an A-3 priority will be limited during the period Sept. 1 to Nov. 30 to a rate of 60 per cent of the parts sold for replacement purposes during the first six months of 1941.

The same goes for parts enjoying an A-10 priority with the exception that the period specified is Sept. 15 to Dec. 31.

All Motor Truck Users Get Parts Priority

The foregoing is evidence that OPM is trying to provide for the manufacture of replacement parts for trucks and trailers.

Now there is evidence that OPM wants motor truck users to get first crack at the replacement parts pro-

some official determination of the classification of trucks which, for example, have been spread-rated at 1½ to 4 tons, or 2 to 5 tons, etc. Are they medium or heavy? The problem may plague some manufacturers but there is no reason to suspect that OPM will take an unsympathetic attitude.

The A-3 priority order and production limitation plan are published in detail on page 35 of this issue.

No Preference Rating for Light Trucks

Light trucks, that is trucks under 1½ tons, are without a priority rating as to materials. Manufacturers have had the matter up before OPM but the answer so far has been "no." The only concession OPM has made

CCJ QUIZ



by ROBERT F. BAHL

Sweep out those cobwebs! Brush up on your truck knowledge with these Quiz Questions. To make it more interesting, keep score. Find how you rate. Give yourself 10 points for each correct answer. 100 obviously is perfect; 90 is very good; 80 good; 70 fair; 60 starts getting doubtful. If you can't hit 50, watch out . . . the man is around to take measurements for dunce caps.

(Correct answers on page 80)

1

Trucks are immeasurably more impor-

tant to our armed forces today than they were 24 years ago, but even back in World War No. 1 quite a few trucks were required. What is your estimate of the number of trucks ordered by the Army and Navy in 1917-1918?

- a. 10,000
- b. 25,000
- c. 200,000
- d. 1,000,000

2

The only inflation you'll have in your tires and tubes now is the kind you get with compressed air. The government has frozen the price of finished rubber goods at:

- a. 1939 levels.
- b. The price prevailing on Jan. 1, 1941.
- c. Five per cent in excess of the price prevailing on June 16, 1941.
- d. 37½ per cent mark-up on dealer's actual cost.

3

Can you tell us what is meant, in automotive lingo, by a *grounder*?

- a. It is an audible testing device for

armatures.

- b. It is a truck driver who constantly complains about the traffic.
- c. It is an engine that is missing.
- d. It is one of the gears in the differential.

4

Perhaps you have wondered why gasoline trucks usually have a chain dragging along the road? Well, you'll find the answer among these:

- a. It serves as a warning to the motorist behind.
- b. It carries off static electricity.
- c. It is required by I.C.C. regulations.
- d. It is the result of carelessness on the part of the driver.

5

"Some day we shall grow most of an automobile." These are famous words of a famous man. Who?

- a. Thomas A. Edison
- b. Henry Ford
- c. Rudolph Diesel

duced. It came to light on Sept. 9 when the Priorities Division of OPM issued an order granting an A-10 preference rating to truck users for repair parts needed "because of an actual or imminent breakdown" and also to get deliveries of parts for "emergency inventory," which is defined as a "minimum inventory of Material required to provide for repairs to meet an actual or imminent breakdown."

"Material" is defined as "any commodity, equipment, accessories, parts, assemblies or products of any kind." The order is specific in stipulating that this "Material" is solely for "repairs, actual or imminent."

There are 20 "essential industries" on the list. The order is "for the purpose of facilitating the acquisition of Material for the Repair of the property or equipment" of these industries.

This preference rating order, together with instructions to truck users on its use, is given in full on page 136 of this issue.

Preference Ratings Now Mandatory

The value of preference ratings has been enhanced by a new regulation of the OPM Division of Priorities. This regulation makes all preference ratings mandatory. Heretofore only

Army and Navy contracts enjoyed mandatory preference ratings. All other ratings were issued with the expectation of voluntary cooperation of the persons concerned. It must be assumed that this voluntary cooperation was not forthcoming and that many preference ratings therefore had little meaning. Producers generally are understood to welcome the mandatory order because it relieves them of making embarrassing decisions based upon business expediency.

However, even though preference ratings are made mandatory there remains the problem of so-called big business versus little business where both enjoy the same preference rating. Washington know-it-alls claim that small business is discriminated against and that the entire situation, as it pertains to civilian supply, is working up to a blow-off that will make headlines. Leon Henderson is understood to be expecting it—with wide-open, welcoming arms.

So far it has been a case of every man for himself with the quite natural result that the larger the business, the greater its influence and the better it fared on materials. There are some who believe that the problem will not be solved until OPM decides upon allocation, or rationing, of materials.

(TURN TO PAGE 88, PLEASE)

d. Charles Kettering

6

Dick Whittington, according to the legend, went to London to see the streets paved with gold. Our highways aren't paved with gold, but nevertheless they run into the ciphers. The average cost of a mile of concrete road is:

- a. \$1,000
- b. \$10,000
- c. \$35,000
- d. \$100,000

7

There are all kinds of "horsepower," and each one seems to have a different value. (Maybe they are those horses of a different color one hears about.) Seriously, what name is given to the horsepower rating for reducing all engines to a common basis for determining the fee to be paid for license plates?

- a. Brake horsepower
- b. Indicated horsepower
- c. A.M.A. horsepower
- d. Nominal horsepower

8

Which of these uses the greatest amount of current?

- a. Headlamps
- b. Radio
- c. Spotlight
- d. Electric windshield wiper
- e. Cigar lighter
- f. Heater
- g. Defroster

9

Just to keep you from getting stale in your automotive chemistry, we're going to ask what causes gasoline to become "stale."

- a. Exposure to the atmosphere.
- b. Subjection to heat.
- c. Freezing, then thawing.
- d. Over-age.

10

If India ink comes from Japan, Panama hats from Ecuador, and Scotch tape from Minnesota, then what is the source of the china clay in your spark plugs?

- a. Chile
- b. U.S.S.R.
- c. Mexico
- d. England



... a special selection made by the editors ... to get your copy, just check the letter on the post card between pages 122 and 123 which corresponds with the item you desire and mail to Commercial Car Journal, Philadelphia.

Battery Service Manual

Packed with tips on efficient battery installation and maintenance, this 16-page manual perforated to fit a loose-leaf file, is issued by Globe-Union Mfg. Co. The manual describes correct charging practice and care after installation, and contains an electrical check-up and battery testing chart. A practical explanation of how a battery functions is also included in the booklet. Check "A" on the postcard.

Precision Lathe Catalog

A new condensed catalog describing its entire line of lathes has just been issued by South Bend Lathe Works. Data compiled herein includes basic dimensions, capacities, speeds and feeds of back-geared, screw cutting lathes having 9, 10, 13, 14½ and 16-in. swings, with bed lengths from 3 to 12 ft. Numerous attachments for tool-room and production work are illustrated. Check "B" on the postcard.

Steam Cleaner Booklet

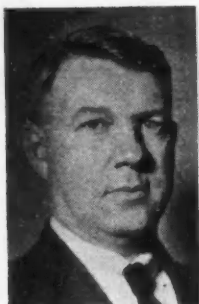
The Homestead Valve Mfg. Co., has issued a new booklet containing elaborate specifications for Hypressure Jenny steam cleaners. Various applications of the cleaner are illustrated and described, together with suggestions on correct handling and adjustment. Check "C" on the postcard.

Soldering Manual

"Facts On Soldering," is the title of a manual issued by Kester Solder Co. It includes chapters on fluxes, solders and application of solders and flux. Soldering irons and methods for handling them are illustrated. Check "D" on the postcard.

Auto Hoists

This is the subject of a specification catalog issued by the Globe Hoist Co. Profusely illustrated, it contains complete specifications on various size hoists, their application, installation and maintenance. Correct lubrication with the aid of Globe hoists is also discussed in detail. Check "E" on the postcard.



H. C. Mougey

THE oil used in lubricating an automobile engine is just as much a part of the engine as a piston, a valve, or a crankshaft.

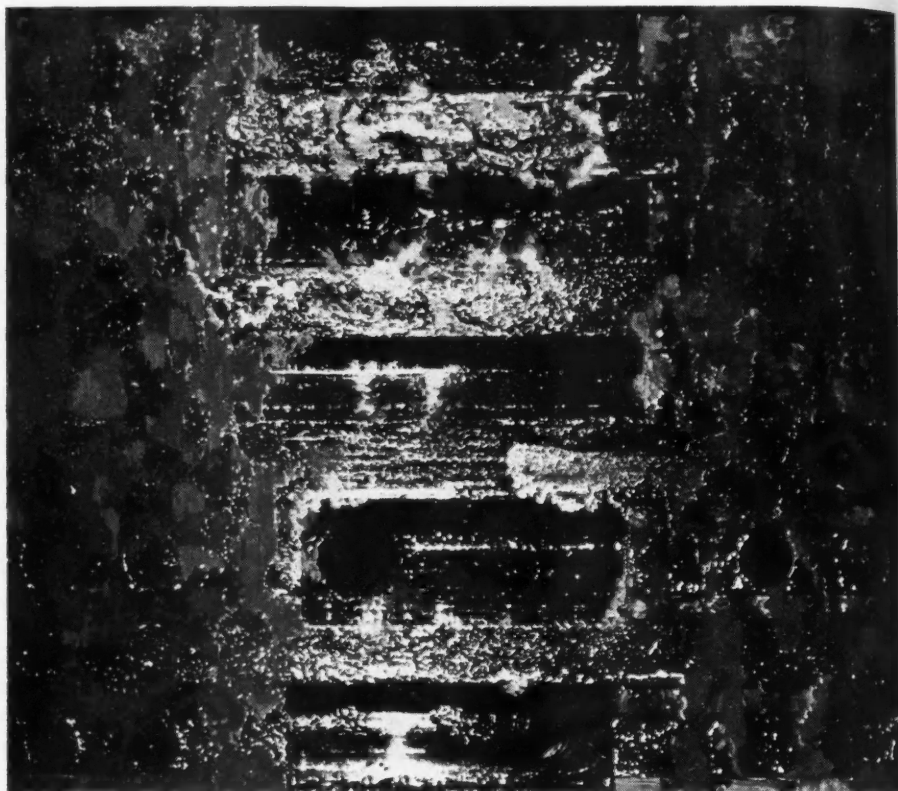
The properties which an oil should have to be satisfactory in an engine are just as much subject to the factors of engine design and operating conditions as a piston, a valve, or other engine part. In the early days of the automobile industry, oil was not the limiting factor on engine performance, and in general, the failures in the very early engines were due to weaknesses in design or composition of parts such as pistons, valves, etc., rather than due to causes for which the crankcase oil was responsible.

However, over a period of years these mechanical weaknesses have been overcome to a large extent and, at the present time, one of the principal reasons why an engine must be overhauled and repaired is because of the effects on the other engine parts of the decomposition products from the crankcase or combustion chambers. Ring sticking and wear of the cylinders, rings, or pistons and the effects of carbon or sludge or varnish on the piston surfaces are typical examples. The lack of lubrication due to carbon or to sludge plugging oil passages, and corrosion of alloy bearings due to acids formed by oxidation of the oil are other examples. But before condemning "sludge" too severely, we should investigate it and learn more about its causes, composition and effects, for there are many kinds of "sludge," some of which are bad in themselves but others may be disliked more on account of their associates than for their own faults.

There are two fundamentally different types of sludge:

1. Low temperature sludge.
2. High temperature sludge.

Low temperature sludge is simply an emulsion of water and oil, which is formed by water from the products of combustion of the gasoline



Above: Photograph showing close-up of high temperature sludge at piston rings

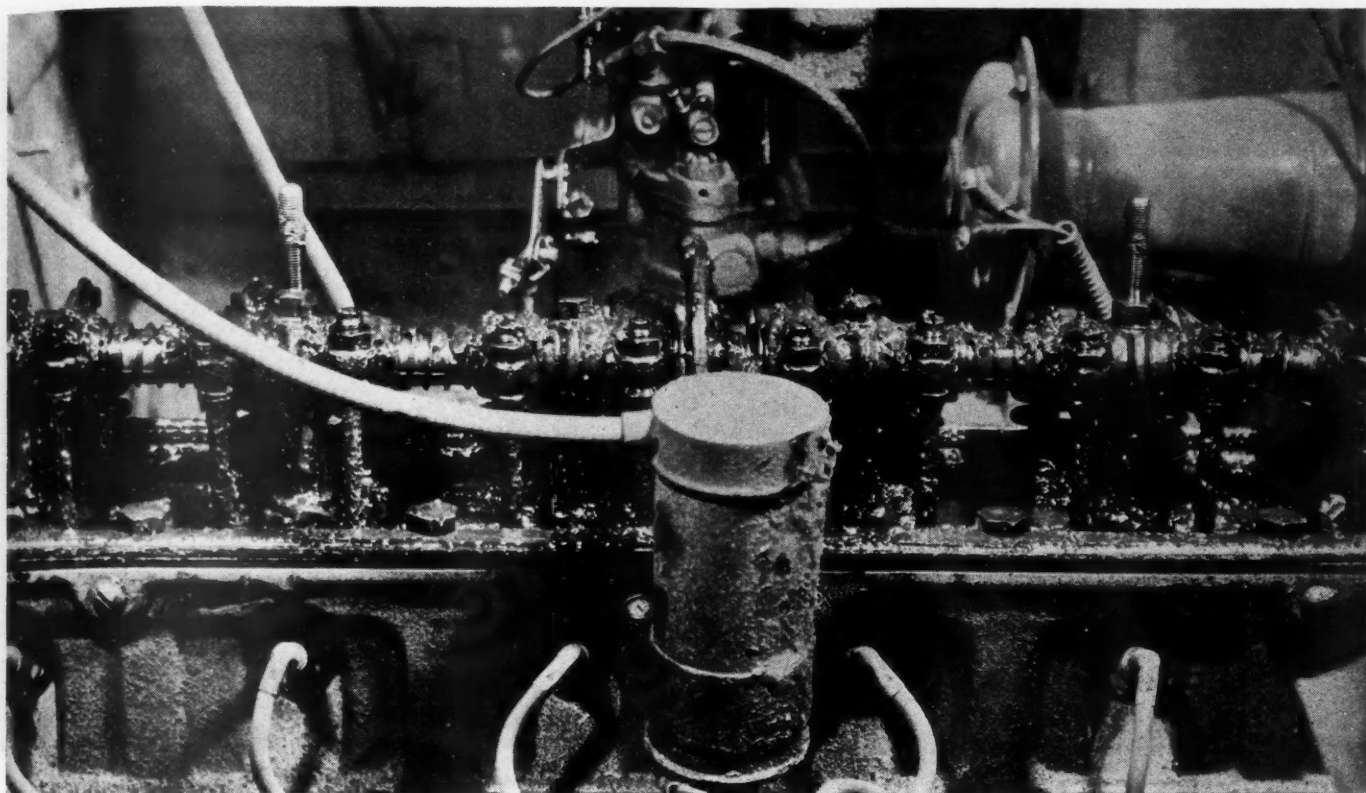
SLUDGE: HIGH AND

in the combustion chamber getting past the pistons, and condensing in the crankcase and mixing with oil. Fundamentally, this sludge is largely a mixture of water and oil and is very much like mayonnaise. However, low temperature sludge usually contains acids, also resulting from condensation of the products of combustion, and low temperature sludge is usually very corrosive, causing rusting and rapid loss of metal of cylinder walls, pistons and other engine parts.

In addition, the water in the sludge is subject to freezing, and ice crystals so formed may plug oil lines and cause burned out bearings due to lack of lubrication. Altogether, low temperature sludge is a very undesirable fellow, properly disliked for his own mean disposition, but the properties of the oil as pur-

chased from the oil company are usually not in any way responsible for low temperature sludge.

There is another factor that complicates the low temperature sludge problem. If the temperatures in the combustion chamber are too low, such as may occur with idling, light loads, or as a result of low air temperature in winter, combustion processes in the combustion chamber may not proceed in a satisfactory manner. Carbon may be formed in the combustion chamber, causing the many "carbon" troubles with which engines used to suffer a number of years ago. Some of this carbon may foul the spark plugs, some may prevent the valves from working properly, some may plug oil control rings and oil passages and some may get past the pistons and mix with the water and oil in the crankcase, giving low



Above: Low temperature sludge at valve rocker arms after 3,500 miles of slow speed multi-stop operation

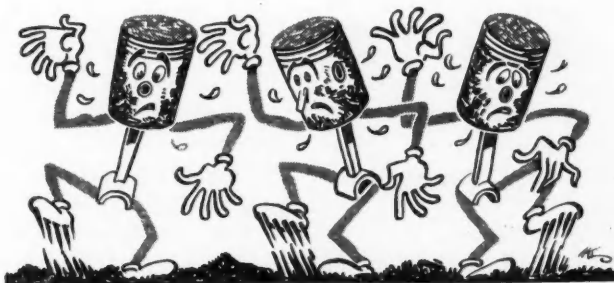
LOW TEMPERATURE

temperature sludge its black color.

The problem of low temperature sludge, together with its relatives, crankcase corrosion, crankcase dilution, carbon deposits, fouled spark plugs, bearings burned out due to oil passages becoming plugged with ice, etc., attracted considerable attention a number of years ago. However, it was soon found that the commercial solution to these problems was an increase in temperature of the crankcase and combustion chamber, and the proper use of thermostats and crankcase ventilation.

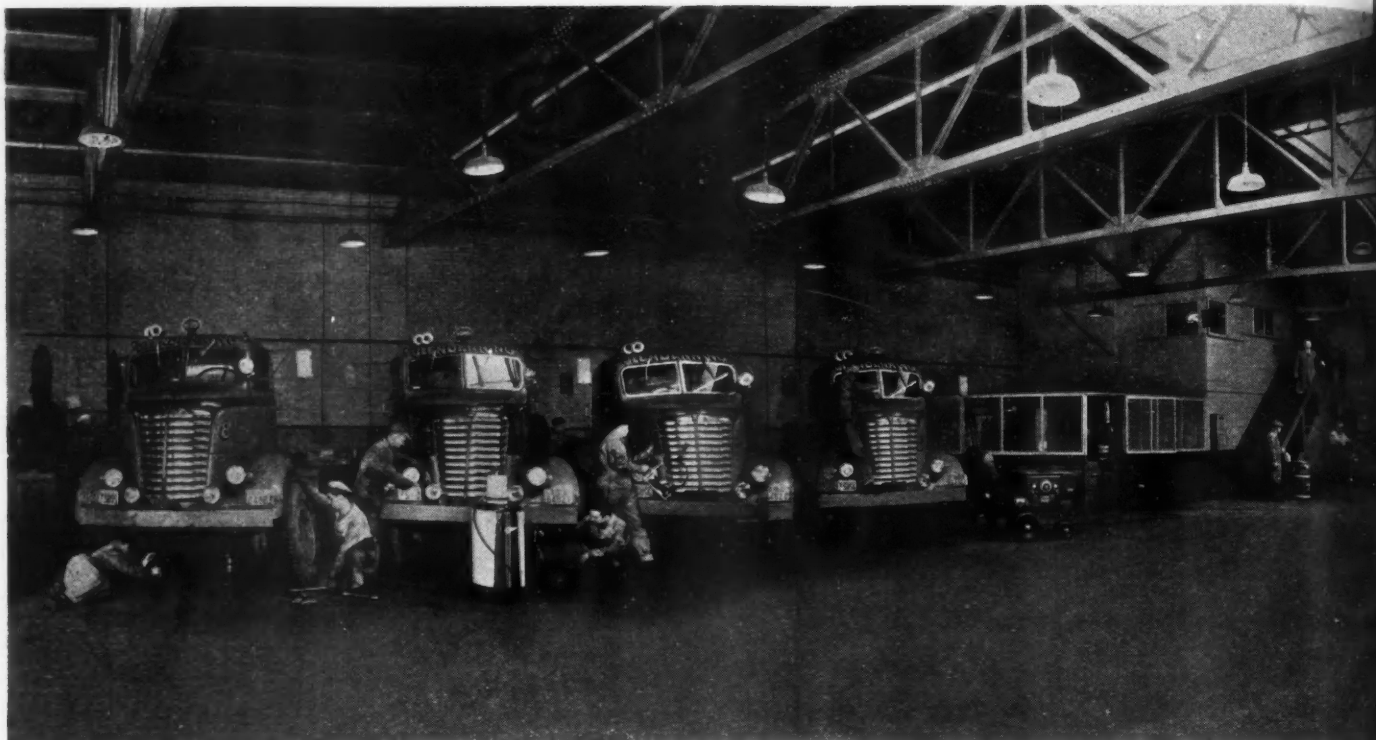
Although in most engines and operating conditions low temperature sludge has been under control for a number of years, what about high temperature sludge? High temperature sludge is a mixture of oil together with carbon and other
(TURN TO PAGE 94, PLEASE)

A study of sludge made especially for fleetmen—its causes, composition and effects—with some expert hints on what they can do about it



by HARRY C. MOUGEY

Technical Director, General Motors Research Laboratories



Repairs are handled in Glendenning's own spacious shop by mechanics trained to work on both diesel and gas engines

GANGWAY FOR



5000-mile check-ups and own shop repairs are and irons out road failures nearly 100 per



W. G. Glendenning

GETTING the most out of its equipment for the longest possible time without impairing efficiency of operation is the goal of Glendenning Motorways, Inc., of St. Paul, Minn. In order to achieve that goal, the company has devised a low-cost maintenance program that has practically eliminated road failures from its experience.

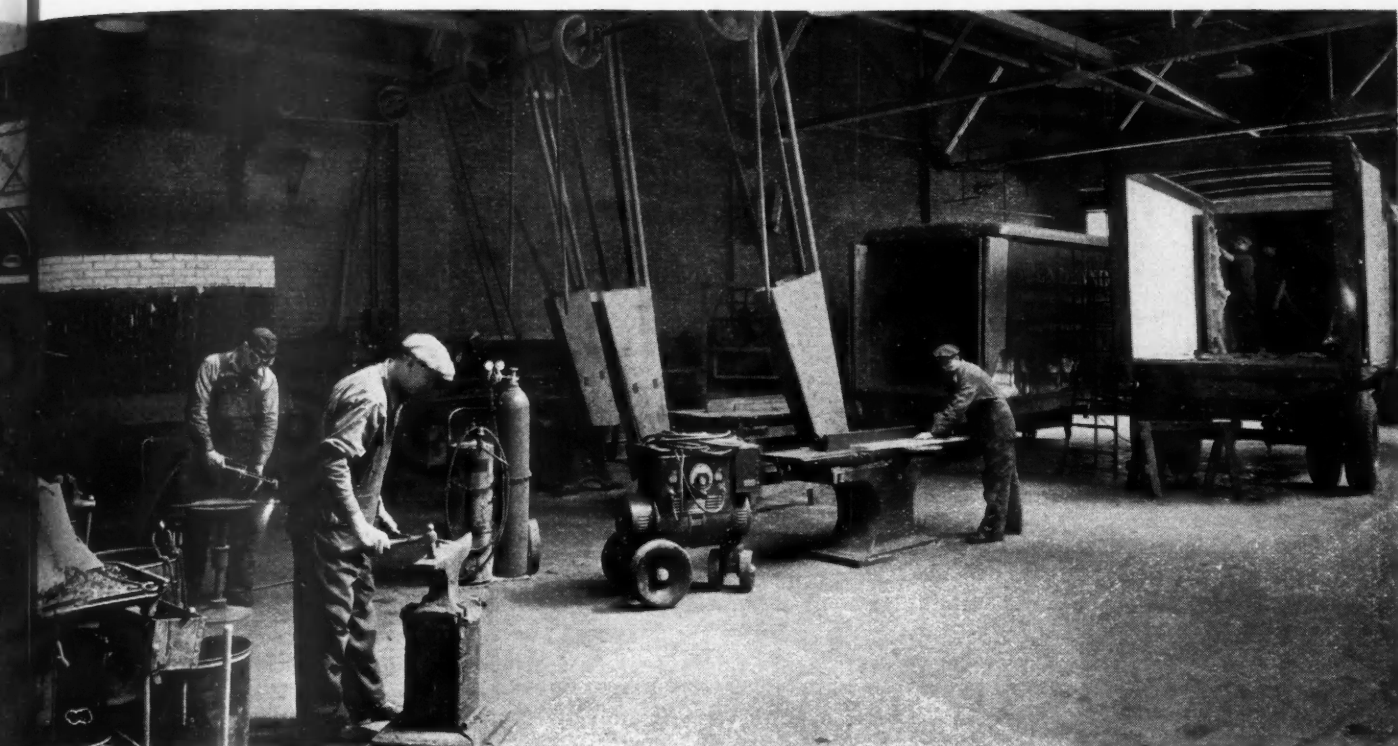
Big, fast and efficient, the 118 units of the Glendenning operation provide service between Chicago, Milwaukee, and southern Minnesota, northwestern Wisconsin, Duluth, the Twin Cities and Fargo, N. D.

The home terminal in St. Paul, one of the largest in the northwest, consists of a 24,000 sq.-ft. building housing the shops, garage, loading docks and office. The terminal is located on University Avenue, the principal thoroughfare between Minneapolis and St. Paul.

Glendenning's policy of maintenance for long service begins with exacting standards for purchasing new equipment. Of the 48 tractors in the fleet, 26 are diesels. The firm's aim is toward an all-diesel fleet with units having standard piston displacements of 283.6 cu. in. Due to

gross weight limitations, the firm seeks light units (carrying 10 to 11 tons) which are, at the same time, sturdy and powerful. Overall length is limited to 35 ft.

The firm operates, in addition, 23 trucks and 46 semi-trailers. Twelve of the latter are of aluminum, with the most recent purchases being ribbed steel. Thirty-eight of the semi-trailers are refrigerated, six are open-top and two are combinations of refrigeration and open-top. Twelve of the trailers have mechanical refrigeration.



The body shop is equally spacious and fully equipped to do a complete body job in the shortest possible time

GLENDENNING!



main cogs in preventive maintenance program that cuts costs, rolls up miles
cent for this diesel and gasoline-powered fleet • • • • by MILTON FIGEN

ation, 17 have brine washed-air cooling and the balance wet and dry ice cooling. The eventual goal is a fleet entirely cooled by mechanical refrigeration as this has been found most practical.

The Glendenning program calls for depreciating tractors and truck chassis over four years, and semi-trailers and truck bodies over six years, despite the firm's efficient maintenance system which permits operation considerably beyond this depreciation period. Up until June of last year,

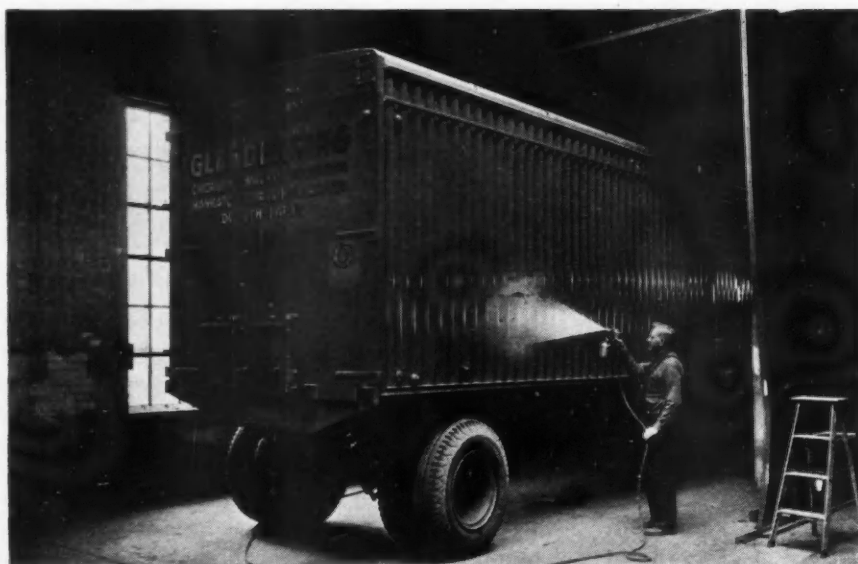
for example, three tractors still in operation had piled up a total of 3,351,000 miles of service—better than one million miles apiece. One of the units was purchased in 1930 and two in 1932. The 1930 unit, with a gross weight of 10,000 lb., made three 875-mile round trips weekly between Chicago and St. Paul up until 1939, after which it was used on shorter runs into southern Minnesota.

Believing that an ounce of prevention is worth a pound of cure, the

company went full-tilt for a preventive maintenance program. Such a program resulted in the establishment of an efficient check-up system and a gradual increase in the amount of repair work handled in Glendenning's own shops. Thus, by exercising increasing control over its automotive repairs through the use of efficient procedures and modern tools, better work as well as economy in time, labor and materials was achieved. As of the current year, Glendenning has completely eliminated farming out

PERIODICAL INSPECTION OF DIESEL			
UNIT #	DATE	MILEAGE	INSPECTED BY
#1 - Check & Adjust if necessary - Tappet Clearance, Injector rack & State Idling Speed			R.P.M.
#2 - Tighten Cyl. head nuts (use tension wrench) - Tighten manifold studs			
#3 - Check and Adjust - Governor Controls & Automatic shut-off & state governor setting			R.P.M.
#4 - Check & Adjust if necessary - Fan Belt, Compressor Belt, Fan Bearings.			
#5 - Check Oil Filters & Motor for oil leaks, check oil pressure & state			500 R.P.M. 1800 R.P.M.
#6 - Check Oil Pressure flexible line going to oil gauge, check all water hose connections.			
#7 - Tighten all fuel oil connections & check for leaks, check fuel oil flexible line at pump.			
#8 - Clean & Tighten all battery connections, check fuel oil line pressure at pump & state			
#9 - Check all lights & Repair general brushes & replace if necessary, check gen. charging rate and state 1800 R.P.M.			
#10 - Check steering for play in adjustment, all steering arm connections & front wheel alignment.			
#11 - Check clutch for pedal clearance, releasing & shifting action, correct if needed.			
#12 - Check hand brake & adjust, check foot brake adjustment, adjust if necessary.			
#13 - Check universal joints, tighten flange bolts, check Tran. & Diff. for grease leaks.			
#14 - Check high & low range shifting action & free up if necessary.			
#15 - Tighten all spring U bolts, check all springs & state condition			
#16 - Check all wheels for bearing adjustment & correct if necessary.			
#17 - Check truck for spare fan & comp. belt & all necessary equipment.			

REMARKS OF GENERAL CONDITION OF TRUCK STATE BELOW:



Photos from top down show the 5000-mile check-up form used to indicate the condition of diesel trucks; a diesel-powered semi-trailer being given a periodical motor check-up; a corner of the paint shop where a trailer unit is keeping a date with the paint beautician. Glendenning's horse-drawn delivery unit is shown top of opposite page

GANGWAY

jobs and is now handling all its own repairs.

Overhauling, such as cylinder reconditioning and line reaming, has been eliminated by use of sleeves for both diesels and gas units. The firm rebuilds its own electrical units and carburetors, with late specialization in diesels cutting down on the need for doing much work with carburetors. Equipment used in electrical unit testing and reclamation includes an armature lathe for generators, an electrical test bench and a volt and ampere tester.

The firm constructed its own tester at a cost of \$12 for testing diesel injectors. The tester was made from a used hydraulic jack from which the cylinder was removed. The jack was cleaned thoroughly and the top plugged. It was then drilled and a 1/8-in. hole tapped out. Through this hole a pipe was run to the gage, from the gage to the injector, and from the return of the injector back to the jack.

One of the most important cogs in the Glendenning maintenance program is the 5000-mile check-up. In operation in its present form since the spring of 1940, it succeeded in reducing road failures by 50 per cent in the first few months. In the past 12 months there has been no serious road failure of any kind—an almost 100 per cent reduction.

The check-up is thorough and systematic. For gas operated tractors it covers checking and resetting the distributor, plugs and spark setting, tightening head bolts and manifold studs; checking compression and fan, fan and compressor belts, water pump; checking and adjusting generator and charging rate; checking lights and cleaning and adjusting battery connections; cleaning gas lines and checking carburetor and

FOR GLENDENNING!



fuel pump; checking steering for play as well as inspecting all steering connections and wheel alignment.

The inspection provides, in addition, for checking the clutch clearance and shifting action; the drive line, universal joints and center bearing; tightening U-joint flange bolts; checking differential pinion play, grease leaks; tightening carrier studs and axle flange studs; checking wheel bearings for looseness and making adjustments where necessary; tightening all spring U bolts; a thorough check-up of brakes, including inspection of lining through hole, checking air pressure, adjusting brakes, if necessary, and checking and repairing air leaks.

As a final measure tractors are checked for spare axle shafts, head gaskets and all necessary belts. These parts are carried in over-the-road units, in special compartments built into the cabs, as a safety measure. The 5000-mile check-up on diesels is equally thorough. This is indicated by the nature of the check-up form illustrated on these pages, one form of which is made out for each unit.

Reclamation of oil is one of the important phases of Glendenning's operation. For the past seven years the firm has used an oil reclamation machine, and periodical product tests are made to insure the quality of the reclaimed oil. All equipment is lubricated, and oil changed, at each 1000 miles. This is done at whatever terminals the units happen to be upon expiration of the 1000-mile running periods. Modern air pressure guns are used in lubrication.

It has been found that new trucks, operating on the 1000-mile oil change system, using reclaimed oil, run up to 150,000 miles on their original bearings, pistons and rings.

The "million mile" units, using reclaimed oil for the most part, ran their millionth mile still on the original motors in which the only major parts replaced were the pistons and valves.

Convinced by its preventive maintenance program that doing its own work at home is a proven economy, the company now does all its own body conditioning and body building work. The body shop is completely fitted with modern equipment that includes planers, saws, joiners and other machines.

"We prefer building our own truck bodies," W. G. Glendenning, head of the firm, explained, "because we can control what goes into every body. If we farmed out this work, we would have to explain just what we wanted built and spend time supervising the job."

Bodies are constructed of selected woods, with steel on the outside, and insulated. They are built to last eight or nine years, but are depreciated over six years, as previously stated. This depreciation period has proved practical in view of the changes governing gross weight and length limitations which occur from time to time in the various states in which the firm operates.

An indication of the value of operating a body shop where every type of work can be done was illustrated last July when word was received that Illinois has raised the overall length limitation from 35 to 40 ft. Plans were immediately prepared to increase the length of the semi-trailers from 27 to 31 ft. and only the arrival of word that the governor of Illinois had vetoed the bill held up action. Had it been necessary to farm out this work, much more time would have been lost and the actual work itself, if done outside,

would have been at greater expense—with equipment off the road for a longer period.

No small part of the successful operation of the maintenance department is due to the personnel, each member of which has received special training in the work he performs. Some of the men have had up to 30 years' experience in mechanical work. The average length of service of members of the Glendenning force itself is approximately eight years. The object of the firm has been both to train its men in improved methods and to keep these men as employees in order to benefit from their special training and experience which originates with the company. The firm employs four mechanics who do nothing but body work and eight mechanics trained in both gas and diesel maintenance. The latter handle every type of mechanical job in connection with either kind of motor and have received special training in diesel work at a mobile instruction school conducted by GMC in the firm's shops. They work under Dick Parnell, shop foreman, also diesel-trained by GMC.

The largest part of the mechanical work is done at the main terminal in St. Paul where four body men and five mechanics are stationed. Two mechanics are in the Chicago terminal and one is at Rochester.

One man is responsible for checking the rubber of each unit before its departure. His task is to see that tire pressure is correct, to check for uneven wear, and to see that cord pairs are properly matched. In order to standardize the brand and grade of fuel used, tanks, which are extra large, are filled only at the terminals.

A pioneer with diesels, the Glendenning company conducted an ex-

(TURN TO PAGE 66, PLEASE)

SHOP HINTS

FROM FLEET SHOPS



National Defense means that trucks will have to work harder than ever. They will have to spend more time on the road and less in the shop. Therefore efficient maintenance is more important than ever. Even parts may be hard to get promptly and certainly they will be more expensive. Skilled mechanics will be scarce. Altogether it means that Shop Hints are more valuable than ever before.

Any idea that will save mechanical labor or salvage some part of a fleet operator's equipment will be eagerly used by fleet operators. Shop Hints not only help other fleet operators but they are a contribution to National Defense since they help keep trucks working when they are most needed.

Commercial Car Journal will see to it that the author or originator of a Shop Hint does not go unrewarded. He will be paid \$5 for every Shop Hint accepted and there is no limit to the number that Commercial Car Journal will accept.

A rough drawing or photograph is sufficient to illustrate the idea. Commercial Car Journal artists make the illustration ready for publication. All you have to do is make us understand what you mean. Send in your Shop Hint idea now.

1. Brake Pliers

By Preston Coleman
Norristown, Pa.

We were having quite a time removing brake shoes from 1936-1941 Chevrolets for relining. We made a pair of pliers especially for this job that reduce the working time to a matter of seconds. The pliers illustrated are used to compress the stiff short spring while you remove or replace the brake shoe linkage. Note its simplicity of construction as indicated in the drawing.

2. Flange Spanner

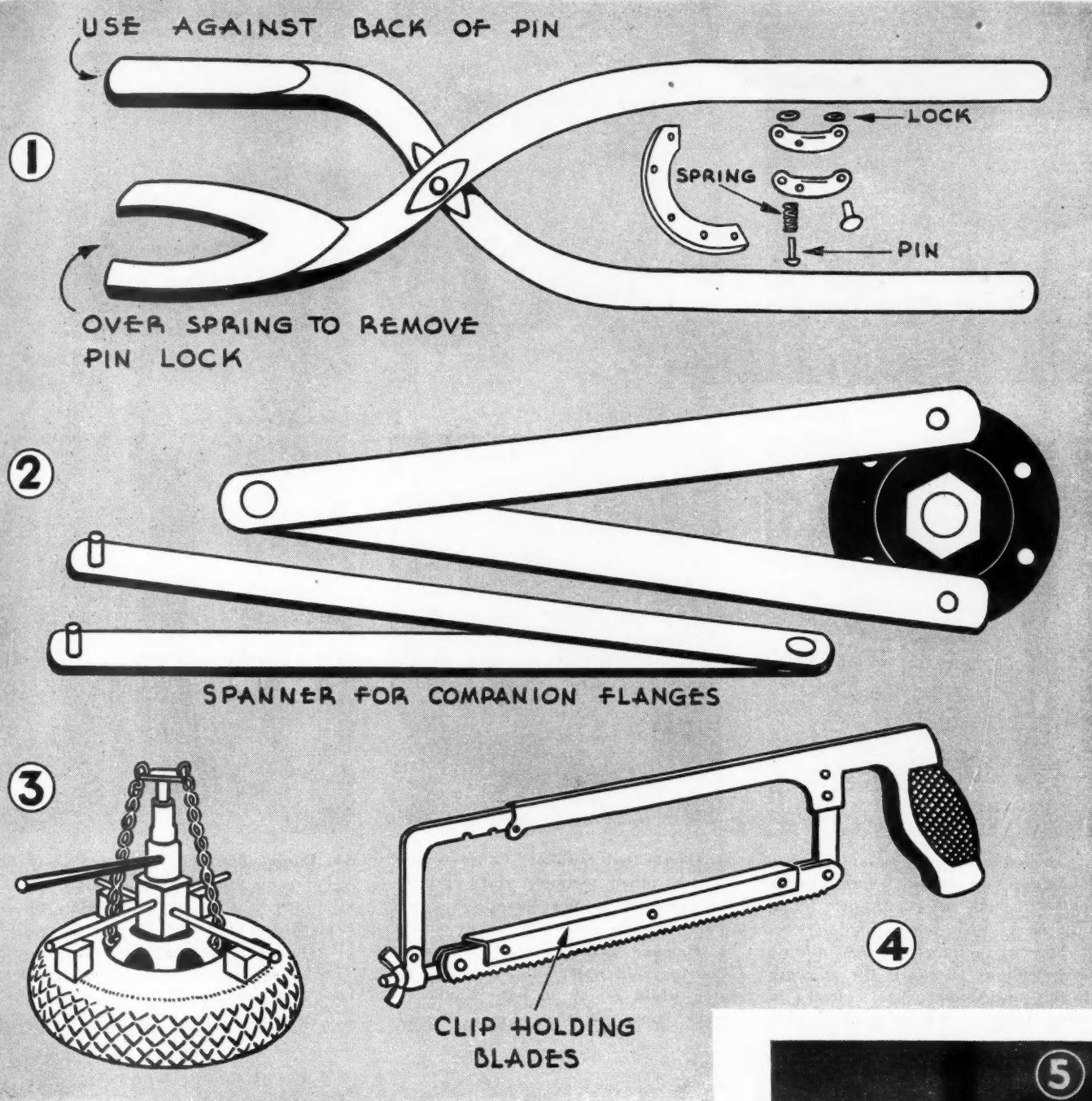
By L. Kripps
Philadelphia, Pa.

It is sometimes very hard to prevent the universal joint companion flange from turning when removing the nut that holds it in place, especially when the work is done under the car. By making a spanner of metal with straps pinned or bolted together at one end and equipped with studs at the other, any size flange with any bolt spacing can be held securely without trouble.

3. Tire Tool

By Major C. Elford Smith
Holabird QM. Depot, Baltimore, Md.

The illustrated tire tool made up of blocks, bars, chain and jack is used to push tires off the rim. The chain is looped though the wheel slots and pulls the rim up while the blocks push the tire down. If the wheel does not have slots, you can drop the chain through the center of the hub and stick a bar through it on the underside of the wheel. Construction of the unit is clearly shown.



4. Slotting Tool

By Paul Volk
Drexel Hill, Pa.

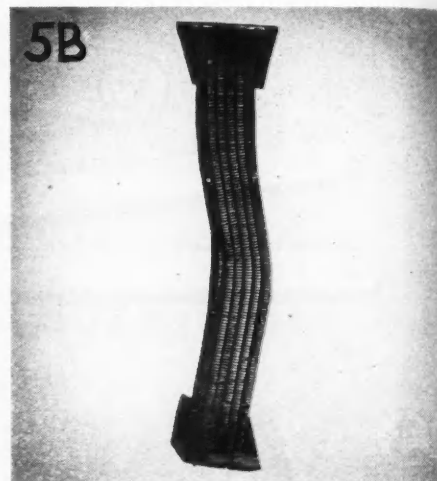
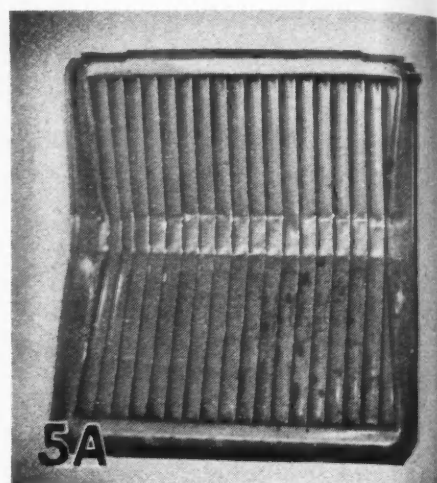
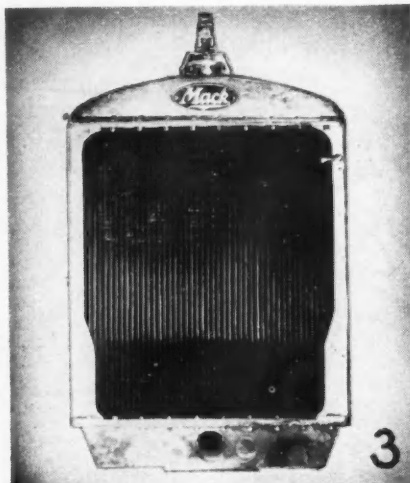
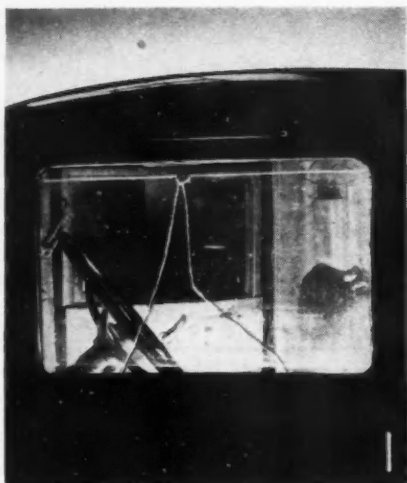
For slotting some screw and bolt heads and cutting keyways more than one hacksaw blade must be used. However the hooks on the ordinary hacksaw frame will hold only one blade in proper tension. A clip can be made of $\frac{1}{2}$ -in. by $\frac{1}{8}$ -in. steel strips and three bolts and nuts that will hold all blades in like tension. Pack the top of the clip to the thickness of the blades used.

5. Cleaning Bucket

By Stanley Lukas
Philadelphia, Pa.

We do a lot of cleaning around our place and it is inconvenient when manipulating a mop to have to stop to move the bucket each time. The photograph shows the way we solved the problem of making floor mopping as easy as possible. Note that the casters are installed outboard so that the bucket will not turn over easily. The brackets were made from scrap with a welding torch.



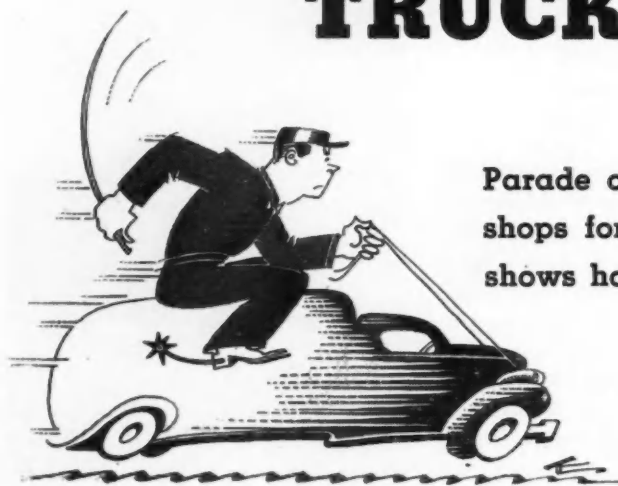


1. Cracked cab door glass: Cause—Sometimes mechanical, but usually neglect, rough usage, faulty handling. Cost—\$15, depending on size.
2. Frozen radiator: Cause—Adding water without checking the strength of the anti-freeze. Note effect on tubes. Cost — \$96 to replace core

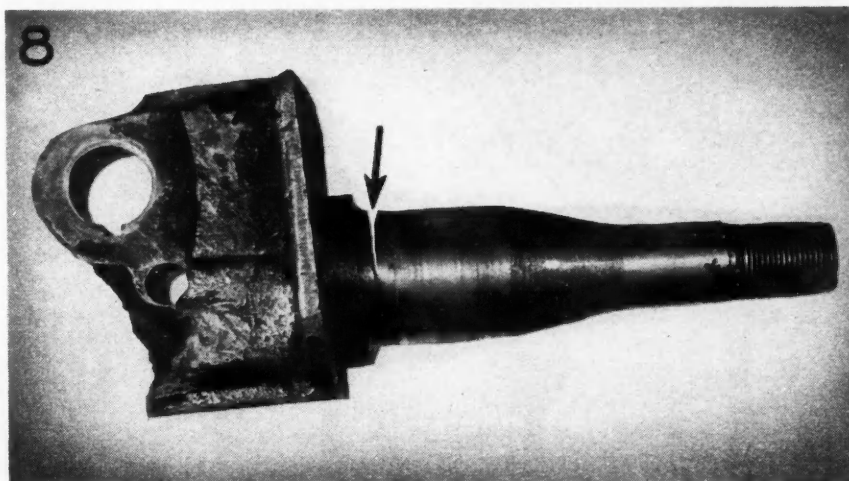
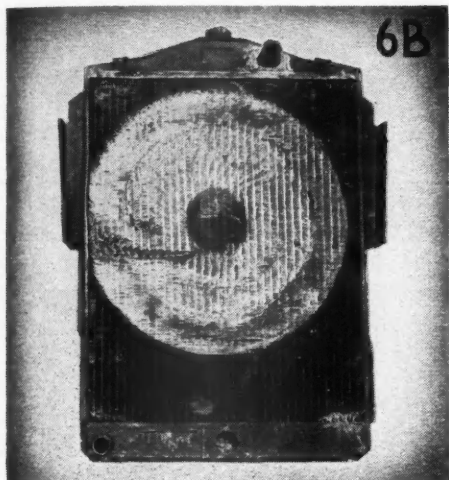
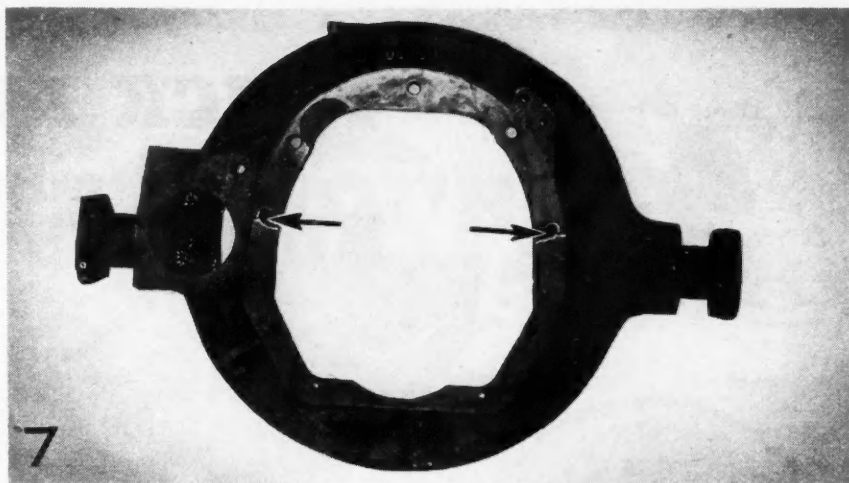
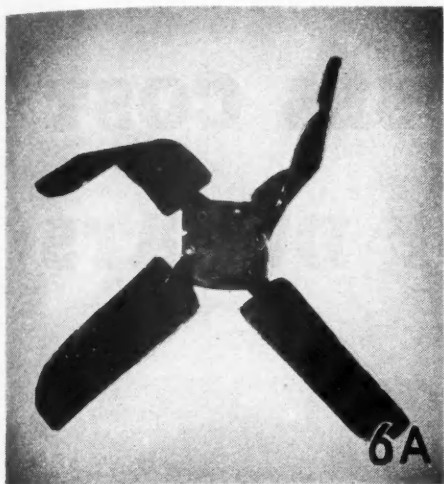
3. Overheated radiator: Cause— Due to too much alcohol, which proved as damaging as not enough. Cost— This damage cost \$38 to repair.
4. Cracked cylinder head: Cause— Pouring cold water in a thirsty radiator while motor is hot. Chalk in crack shows its size. Cost: Plenty!

5A. Damaged radiator shutter: Cause —Following too closely behind another truck, showing poor judgment. Cost: \$14 to replace the entire shutter.
5B. Damaged radiator core: Cause— The banged-up shutter pushed in the core as shown in this side view. Cost: \$76 was spent to replace this core

TRUCK ABUSES COST



Parade of damaged parts culled from Tidewater's shops for this second of a series on truck abuses shows how careless driving ups maintenance costs



6A. Damaged fan: Cause—Driver did not pay attention to rasping sound coming from under engine hood. **6B. Cut-up core:** Cause—The twisted fan in 6A ate into this core to cut an interesting pattern, but in this instance, we are interested in the Cost: \$129 to replace both fan and core

7. Cracked bell housing: Cause—Rocking in a soft fill or hole or against a culvert. Cost: \$148.70 was required to repair this abuse. **8. Broken steering spindle:** Cause—Driver struck a culvert and did not stop to check his truck. Time and material bill for repairs was enough to cause a headache

Tidewater Associated Oil Co. used the abuses shown here to impress drivers with the need for more careful driving. Photographed on 35 mm. film together with captions indicating cause and cost, they were shown to drivers during safety meetings by projecting the film on a screen

BUCKETS OF DUCATS



AN interesting lesson in visual education for truck drivers was achieved a little less than a year ago when the Tidewater Associated Oil Co.'s transportation department prepared a series of illustrations of truck abuses experienced with its mobile equipment. These were published in the December, 1940, issue of **COMMERCIAL CAR JOURNAL**. Herewith

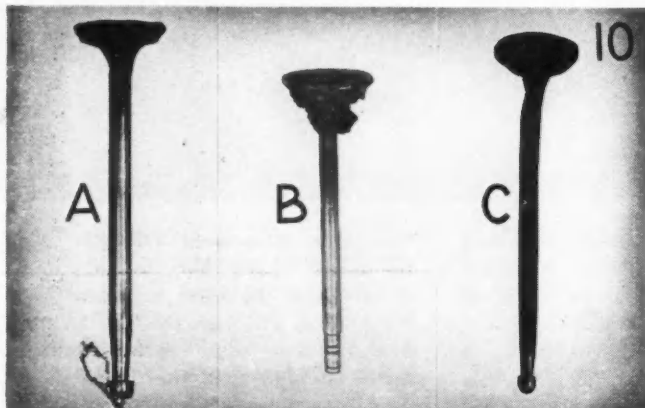
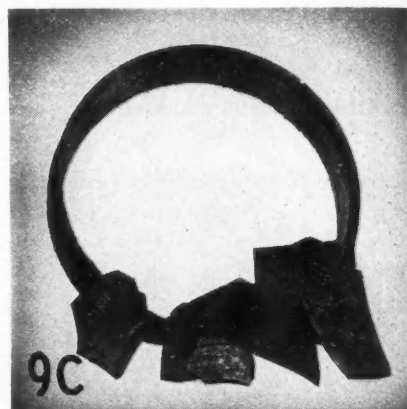
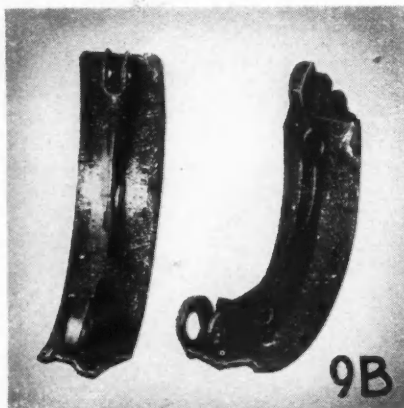
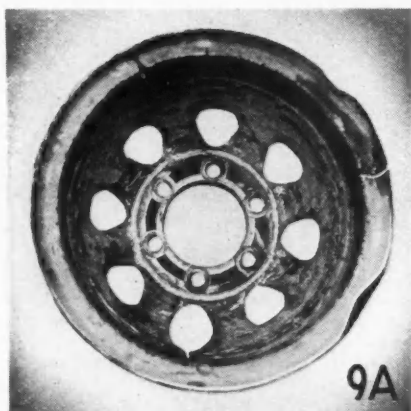
Tidewater presents the second of the series which, like the first, emphasizes the severe damage to certain truck parts caused by driver neglect and abuse.

As part of Tidewater's program of driver education, damage resulting from driver abuse is photographed and discussed at drivers' meetings where all may see for themselves what can happen to a truck because

of driver thoughtlessness. The first "illustrated lecture" proved so successful with drivers that a second group of abuses was prepared for showing. This time the abuses photographed were on 35 mm. film and projected on a screen while a commentator discussed the damaged parts and explained in detail the cause of the breakage and the cost of repairs. Most important was the



TRUCK ABUSES COST BUCKETS OF DUCATS



9A. Bent wheel: Cause—Slamming rear wheel diagonally up over curb. 9B. Broken brake shoe: Cause—As a result of slamming wheel over curb, brakes began going bad. An inspection revealed brake shoes bent and distorted. As soon as the wheel was off the drum, it collapsed—see 9C. Cost: \$174.90 to take care of damage

10. Burned valves: Cause—Running with choke open, over-riding speed of engine on down-grades and gunning engine when idling. Cost: \$40 for replacement and repairs. 11. Burned piston: Cause—Top ring land burned and piston blew—see A. Driver paid no attention to the resulting hiss or blow back and piston collapsed (B).

explanation of how the damage could be prevented.

According to Tidewater's maintenance supervisor, C. D. Healey, the presentations are achieving the two main objectives for which they were designed, namely, to (1) lower maintenance costs and (2) increase safety.

"At the conclusion of a lecture," explained Mr. Healey, "mimeographed copies of the talk are passed out to all drivers present. Each driver is also given a questionnaire, based upon the presentation, with the re-

quest that he fill it out and turn it in to the plant office. (Ed. Note—The second questionnaire is presented at the end of this article.) Drivers are told to refer to the talk or to any other source they wish when filling out the questionnaire. The sole purpose of this method is to fix permanently in the minds of the drivers a better understanding of the costly and unsafe effects of improper handling of trucks.

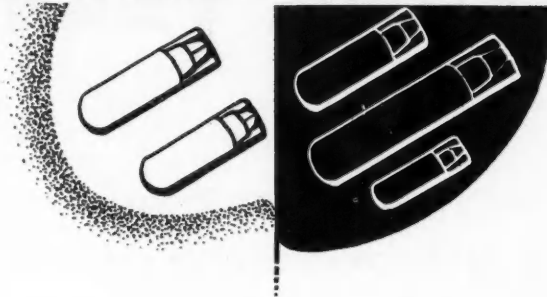
"Psychologically, we base this procedure on the premise that the treatment gets the subject matter over the

counter better than the usual 'pep talk' at drivers' meetings, where exhortation and scolding are common practice. We present something tangible based on the assumption that men are more retentive of what they see than of what they hear. The reaction of drivers has been good. It indicates an over-all improvement in driver attitude.

"The result of our first talk was so gratifying and the reaction so favorable that we looked forward to this second of the series with a much

(TURN TO PAGE 70, PLEASE)

AFTER HOURS



The Repair Parts Order and a Hint to the Central Motor Transportation Committee

SO far as fleet operators are concerned the most important act to date of the Priorities Division of the Office of Production Management was its issuance of an order giving all truck users an A-10 preference rating on repair parts. It should help fleetmen to perform the first task expected of them, that is, to maintain efficient operation of the trucks now in use.

If there are operators who have seen this priority order, No. P-22, and who were confused by the term "freight" as used in it, this is to reassure them that whatever they are hauling is "freight" to OPM.

Truck users are among the 20 "essential industries and services" listed in the repair parts priority order. The specific reference to them is as follows:

"Urban, suburban, interurban and intercity common, contract and private carriers of passengers or freight by electric railway, electric coach, motor truck, or bus, including terminals."

Dairies don't usually speak of the loads their delivery trucks carry as "freight." Neither do department stores, coal dealers, laundries, newspapers, bakeries, grocers and the like. Among truck users the term "freight" is generally reserved for the cargoes of for-hire carriers.

The possibility of confusion occurred to us when we studied the repair parts priority order. In fact we had come to the conclusion that such confusion could be avoided through the good offices of the Central Motor

Transportation Committee. On the strength of that conclusion we had already written the following editorial comment:

"An important and practical service that the Central Motor Transportation Committee can perform for truck users is to get official interpretations and clarifications of priority orders as they are issued by the Office of Production Management. It may be that the Committee has this as one of its objectives, in which case this comment may be taken as supporting evidence of its need. On the other hand, it may be that the Committee has overlooked this obvious function in which case this suggestion will serve as a reminder.

"It is a fact that the Priorities Division of OPM has seen the need of simplified and easily understood orders. It has seen the need of cutting red-tape to a minimum in order to speed up compliance and procurement. There was a time, for instance, when it was necessary first to apply to the Priorities Division of OPM and pursue the tedious process of proving qualification for a priority certification. The present practice permits those who consider themselves covered by a priority to endorse their orders to that effect by merely citing the priority rating order to which they consider themselves entitled.

"It is also true that priority orders are not legalistic. But words are words and meaning is meaning and even a simple word can complicate a meaning.

"Take, for example, the Division's P-22 priority order giving an A-10 preference rating on repair parts to 20 essential industries. Among the industries named are 'urban, suburban, interurban and intercity common, contract and private carriers of freight by motor truck.' The term 'freight' seems to be a pretty explicit word but, in this case, is it?"

And that is as far as we had got when the telephone rang and an official of a department store fleet identified himself. Believe it or not, he wanted to know if the term "freight" included or excluded him.

A reader in doubt is a powerful symbol to an editor. This one galvanized us into action. We called our Washington Bureau, stated the problem and requested an official interpretation from the Priorities Division of OPM. In half an hour word came that the term "freight" as used was meant to include coal, milk and all sorts of merchandise. In short, that it was meant to be all-inclusive.

ALL truck users are, therefore, covered by the P-22 order and all are entitled to use the A-10 preference rating in ordering parts for repairs because of an "actual or imminent breakdown," and also for the setting up or replenishing of an "emergency inventory" to provide for repairs to meet an actual or imminent breakdown. The latter is proof that OPM does not want fleets, for instance, to be caught with their parts down. The effect of the order is to give fleets first crack at replacement parts stocks.

A TANK FLEET WITH

"No Dirt" is a Palmer Transfer maxim that cuts down operating expenses almost as fast as it builds good will



by HENRY JENNINGS

Technical Editor, Commercial Car Journal



THE gas station man at Ell's Corners said, "Palmer Transfer?—it's about 12 miles from Scranton. Go right on up Route 611 for about 5 miles and then turn left on 502. It's a big place next to the schoolhouse. You can't miss it.

Well, we did miss it. We made the left turn at the right place and located the schoolhouse and saw a big new one-story building without any

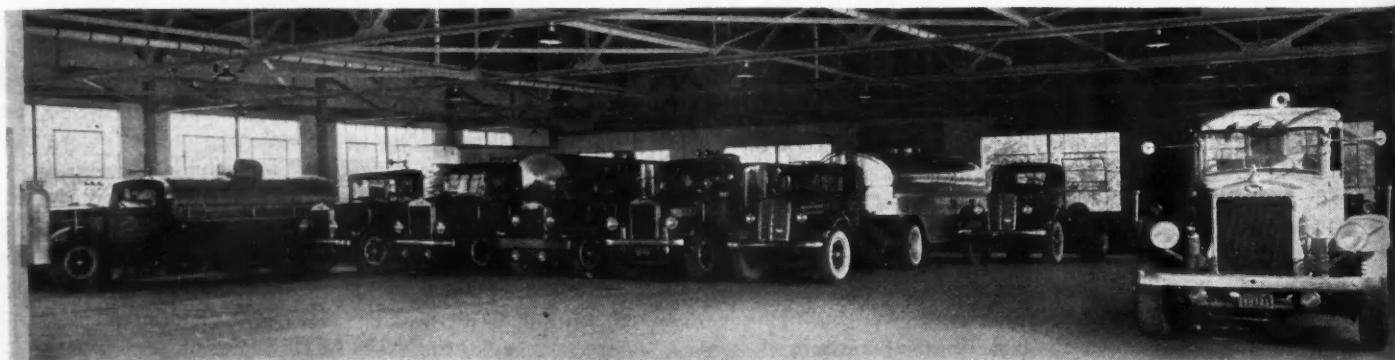
identifying name on it next to the school. We got completely past it before we said, "Whew!" and turned around and went back for another look.

Since there was no other building near the schoolhouse, the one we passed had to be it, although it looked like anything but a fleet shop. Set back from the country highway behind a vast expanse of green lawn that would do credit to a putting

green, was a new brick building marked principally by two huge doors at either side and a neat office behind a plate glass window in the center. We turned up the circular driveway and put our car in the parking lot.

Inside we asked a man at a shop desk if Henry Thompson, who is superintendent of Palmer Transfer, was around. The man motioned out the front door. While we were parking our car, Thompson had apparently

Cleanliness of the Palmer shop is emphasized by the unretouched photograph below. Washing and painting are done in special corners, inspections and lubrications are done anywhere, so the shop along rear wall is unusually small



SWANK



gone out on the lawn, where we found him engaged in cutting the grass with a power lawnmower. We asked him how the maintenance ran on the lawnmower and he said it was not very high but that the contraption was sometimes tricky to start.

Getting down to business, Thompson took us into his office just off the garage. It would do credit to a minor moving picture executive. Instead of lining his walls with pictures of

glamorous gals in seductive poses he has lined it with photographs of the units in his fleet ready for more arduous work. Right at the outset we found out that the fleet consists of 56 pieces of equipment, divided as follows: 22 trailers, 27 tractors, 3 small van trucks, 3 tank trucks, 1 pickup truck and 4 passenger cars.

The shop and equipment were incredibly clean as if to deliberately match the Pocono Mountain setting

which abounds with resort hotels. It would not pay to be too sure that some of the hotels would not suffer by comparison. The building is only two years old and already the white walls inside were being washed down. The floor was spotless. Tom Palmer's little girl, aged about eight, was playing around the shop in the briefest of summer clothing and the only spot discernible on her rather well-exposed

(TURN TO PAGE 58, PLEASE)

Outside of shop, above, is impressive from any angle, but particularly from the green lawn in front. Wash rack is inside right door, paint booth at left, manager's office in center. Below are typical examples of milk and gasoline tank equipment





A SHORT TREATISE ON STEEL TREATING

There are some secrets to treating steel, but many facts are common knowledge. Here is how and why it's done and how the results are tested

COMMERCIAL CAR JOURNAL has received so many shop hints from sincere readers involving trick methods for hardening or softening steel, that it seems the present is an appropriate time to present a few accurate facts about heat treating. This explanation should also make clear to those who submitted unorthodox methods for treating steel why we did not accept their ideas.

One mechanic who wanted to harden a piece of steel suggested that it be heated to cherry red and then rubbed with a white pine block until the friction stopped producing sparks. Another man thought that if you threw a piece of iron into a tub of water after heating, leaving it there until the bubbles stopped, and then heated it again before it dried, the iron would be more workable. Still another thought you can heat steel and measure its quenching time by counting the bubbles.

None of these meet with accepted standards and, as a matter of fact, we are not entirely clear on the reason for some of these suggested processes.

While, undoubtedly, there are many trade secrets in treating steel, much of the science is common knowledge. For the mechanic who would like to know a little about steel, just as a defense against the legendary shop practices to which he is occasionally exposed, here are a few fundamentals.

Let there be no mistake. No one on the CCJ staff poses as a metallurgist. To get the facts given here, we simply went to our library on steel treating, collected an armload of books and pored over them. From the very best authorities in the steel producing business we have gathered such facts as seemed pertinent to this discussion.

One of the earliest known methods of imparting the quality of hardness to iron, thus making it more useful for many purposes, was to add carbon to it. It was originally done by melting iron with wood or charcoal. Slightly more than 1 per cent of carbon was added for this purpose. The iron, with the addition of carbon, became steel. Since then any number of materials besides carbon have been added to iron to give it desirable qualities, with the result that

(TURN TO PAGE 76, PLEASE)

(Ed. Note—On Sept. 12 the Priorities Division of the Office of Production Management issued truck production Limitation Order No. L-1-a and Limited Preference Rating Order P-54, according truck-trailer, body and parts makers an A-3 priority. These orders, which now comprise a co-ordinated program for motor trucks, supplant the orders issued Aug. 30. The new orders simplify administration and are published here in full as a matter of current interest and historical record.)

**TITLE 32—NATIONAL DEFENSE
(PM 1152)**

CHAPTER IX—OFFICE OF PRODUCTION MANAGEMENT

Subchapter B, PRIORITIES DIVISION
Part 976—Motor Trucks, Truck-Trailers and Passenger Carriers

LIMITATION ORDER L-1-a

To restrict the production of medium motor trucks, truck-trailers, passenger carriers and replacement parts

Section 976.1 (Limitation order No. L-1) is hereby amended to read as follows:

WHEREAS, the manufacture of medium motor trucks, truck-trailers and passenger carriers requires the utilization of large quantities of aluminum, chromium, copper, nickel, nickel steel, rubber, steel, tin, tungsten and other critical materials, and national defense requirements have created a shortage of these materials for the combined needs of defense, private account and export; action has already been taken to conserve the supply and direct the distribution of such materials to insure deliveries for defense and for essential civilian requirements; and the present supply of these materials will be insufficient for defense and essential civilian requirements unless the manufacture of medium motor trucks, truck-trailers and passenger carriers is curtailed and the use of critical materials for such manufacture thereby reduced:

Now, therefore, it is hereby ordered that:

976.1 GENERAL LIMITATION ORDER. (a) *Definitions.* For the purposes of this order:

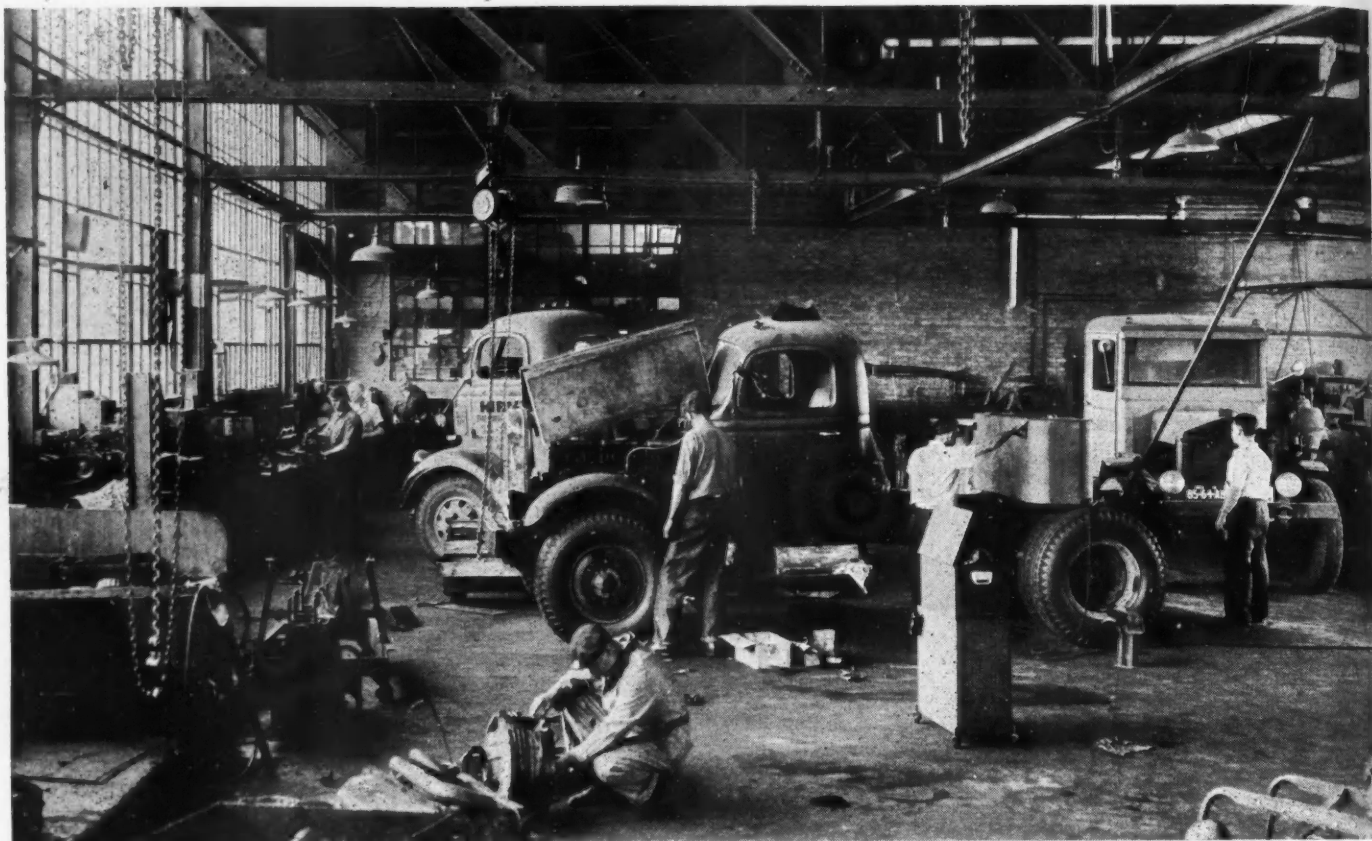
(1) "Medium Motor Truck" means a complete motor truck or truck-tractor of a rated capacity (as advertised by the Producer prior to Aug. 1, 1941) of one and one-half tons or more, but less than three tons, or the chassis, body or cab therefor.

(TURN TO PAGE 44, PLEASE)

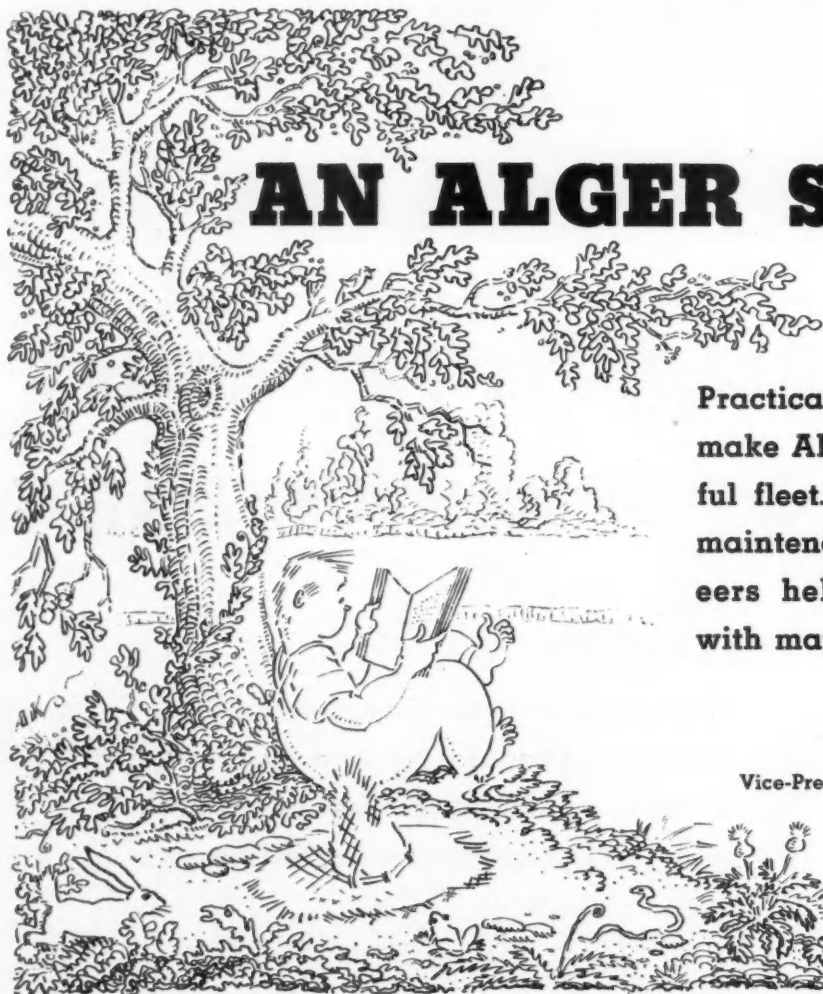


OPM TRUCK PRIORITY & PRODUCTION PLAN

Official orders covering medium and heavy trucks, trailers, bodies and parts and the A-10 priority order covering repair parts for certain users



This is just the rear end of the Alger shop where 30 shopmen work in shifts on a 24-hour schedule to keep trucks rolling



AN ALGER STORY

Practical planning and supervision make Alger (not Horatio) a successful fleet. Safety bonuses, 24-hour maintenance and road safety engineers help keep the fleet rolling with materials for national defense

by A. C. SCOTT

Vice-President & Gen. Mgr., Geo. F. Alger Co.



A driver who has an accident is placed in the "dog house" shown above. Also listed are the names of no-accident drivers



A. C. Scott

PLAYING an important part in the national defense program by hauling materials to build and supply plants engaged in armament production, trucks of the Geo. F. Alger Co., Detroit, are enjoying the busiest season in the company's 25-year history. Structural steel and cement for constructing the new Ford bomber plant at Willow Run, near Ypsilanti, and for the Hudson naval arsenal just outside Detroit, are being transported by Alger units. Steel for shells, guns and other armament also is being hauled by Alger trucks to the Olds Forge plant at Lansing and to such vital Detroit defense plants as Budd Wheel Co., Vickers, Inc., Kelsey-Hayes Wheel Co., Chrysler Corp., Ford Motor Co. and several General Motors plants.

The Alger Co. originated in 1916 when George F. Alger, the founder,

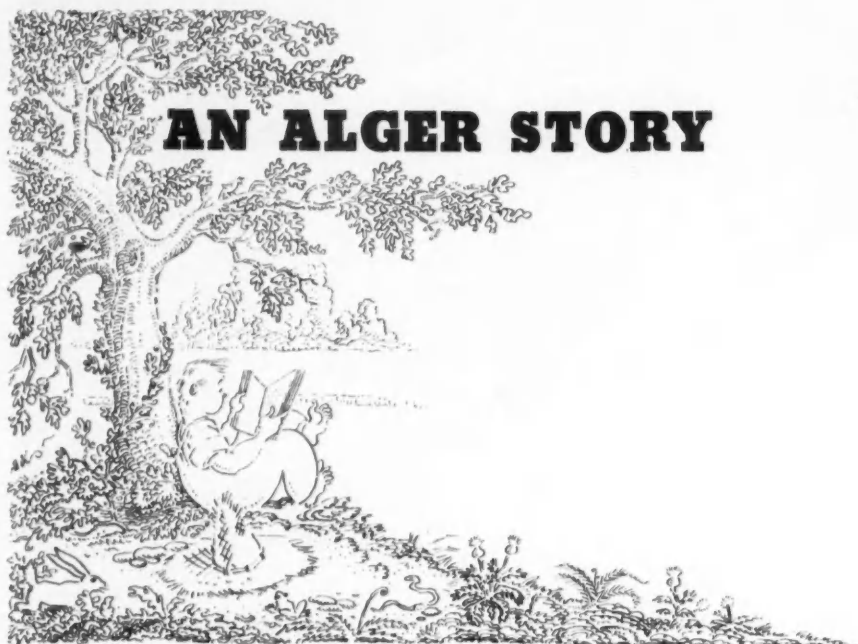
started a dump truck operation with three trucks, one of which he drove himself. From that beginning the company expanded into a specialized hauler of steel, building materials and cement in Michigan and Ohio, for which it now maintains a fleet of 125 tractor units and 325 trailers of both the semi- and four-wheeler type. Last year Alger power units drove 3,600,000 miles and hauled 400,000 tons. This mark will be considerably bettered during 1941, which promises to be the biggest year in the company's history.

Aiding the company's participation in the national defense program is a safety record of only one accident per 75,000 miles for the last five years, despite the fact that Alger trucks often haul a 30-ton payload over Michigan highways. Factors contributing to this safety record are a sensible program of driver education and a thorough policy of preventive maintenance. The Alger Co., and its affiliate, the Kirk Transportation Co., which is an unlimited com-

mon carrier operating 91 tractor units and 130 trailers, have maintained a safety-bonus system for drivers for a number of years.

Cash bonuses totaling \$7,500 went to 176 Alger and Kirk drivers for their 1940 safety records. These were based on a plan, now in operation for the second year, under which each driver is credited with \$4 for each month of 100 per cent safe operation. The first accident for which the driver is at fault brings a \$12 deduction from his bonus, while a second accident costs him \$16 in bonus money. A driver may be dismissed if he is responsible for three accidents.

Some kind of safety-bonus plan has been in effect since 1936. One year all drivers qualifying for it on their safety records were given two-week vacations with pay in Florida. Another year the safe drivers received driving coats from the company. Harold Harris, who has driven for the company for 16 years, has never been responsible for an accident, even though he usually pilots a tractor



hauling a semi-trailer and four-wheeler with a 30-ton payload. Edson Smith, a Kirk driver, has twice won the title of world champion driver at the annual competition of the American Trucking Association. This year Smith and two other Alger drivers, Patrick Weekly and William Carothers, made a sweep of all three classes in the Michigan Trucking Association rodeo.

Thirty-six of the company's 83 drivers have been with the firm for five years or more. A trial court passes on all cases of reckless driving or accident responsibility. This court, which meets monthly, is composed of two drivers, two company officials and a fifth impartial member, often an insurance adjuster, chosen by the other four. The facts on all accidents are reviewed and there is open discussion. Only about six drivers have had to be dismissed for recklessness during the past five years.

Another incentive to safety is the "doghouse," a section of the bulletin board at the main garage simulating a doghouse, in which is placed the name of every driver having an accident, whether he is responsible for it or not. The driver remains in the "doghouse" until he is displaced by some other driver.

Driver-safety meetings are held every two months. Talks and movies on safety are presented to the drivers

and there are general discussions on safety methods.

In hiring drivers, the company requires that they be over 21, physically sound and with a good previous employment record. If possible their records are checked with former employers over the previous five years. A physical examination under ICC standards is annually required of all drivers. New drivers go out on the road with any one of 10 veteran drivers, who serve as instructors for the first several trips, to initiate new men in handling Alger's equipment.

Three company road-safety engineers cover routes constantly to check on driving habits of its men. Traveling in unidentified cars, they report infractions to the safety director. Speeding and following too closely to the preceding truck are the two most common violations. Drivers guilty of infractions may be set down for one to five days, depending upon the severity of the offense. The amount of time and pay they thus lose is left to the discretion of the safety director. Persistent violations will bring appearance before the trial court and possible dismissal. A limit of 30 mph. for company trucks is imposed on the highway, but schedules permit ample leeway to meet them. For example, four hours' running time is allowed for the 84-mile trip from Detroit to Jackson, Mich.

Date _____ 19__	
Report Tire Changes Here	
Vehicle No. _____	Wheel _____
Station at which change is made _____	
Tire removed	G. F. A. No. _____
Tire put in service	G. F. A. No. _____
Tire removed sent to _____	
Reason for change _____	
If Blowout explain cause _____	
Remarks _____	
<small>©1961, Wallace Printing Co., Inc.</small> <small>Driver</small>	

All maintenance operations are centered in the company's garage, a 375 x 78 ft. structure in southwest Detroit. Thirty mechanics provide 24-hour service to keep the trucks rolling. The company operates nine terminals—at Flint, Lansing, Jackson, Mich.; Mansfield, Cleveland, Canton, Toledo and Youngstown, Ohio, and Chicago, Ill. In addition, there are a dozen check stations, located 50 or 60 miles apart along the company's routes, where arrival and departures are recorded and lights, tires and equipment checked.

After each trip the driver makes out a "defect" report on the condition of his truck and trailer. This is required as soon as he checks into the main terminal at Detroit. He checks the condition of the air and hand brakes, steering, horn, ignition, headlights, spotlight, carburetor, tail light, stop light and marker lights. He also details any other particular defects which he has noticed in the equipment and records tire changes, including the serial number of the tire changed and the cause of tire failure.

The shop foreman studies the driver "defect" reports and schedules the repairs in rotation among the various mechanics assigned to that work. The mechanic makes a routine check similar to that of the driver, with the "defect" report as a guide. He goes over the operating equip-

REPAIRS WORK ORDER		Truck No.
Date Finished	Mechanic	
		01
		02
		03
		04
		05
		06
		07
		08
		09
		10
		11
		12
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		100

Opposite page: Tire changes are reported on this form which contains a complete history of the tire

Above: A repairs work order is made out for each truck. This record is filed for ready reference

Right: Note the style of manifest used by Alger. It includes shipping information and trip costs

Below right: The reflector sign at the rear of the truck serves a double purpose: safety and publicity

Bottom: This is the front of the huge Alger garage where trucks receive their minor check-ups

ment, to inspect ignition, carburetion, power brake equipment, cooling system and fan belt. This routine maintenance is conducted in the front end of the company garage.

The garage staff of 30 men includes 14 mechanics, 12 helpers, two tire specialists and two men in the welding department. Most of the men have been with the company from six to 14 years. The staff includes specialists in ignition, floor service, transmission, power brakes, motors, carburetion, tires, wrecker work and rebuilding jobs. Everything but fine machine work, carburetor repairs and painting are done in the company shop.

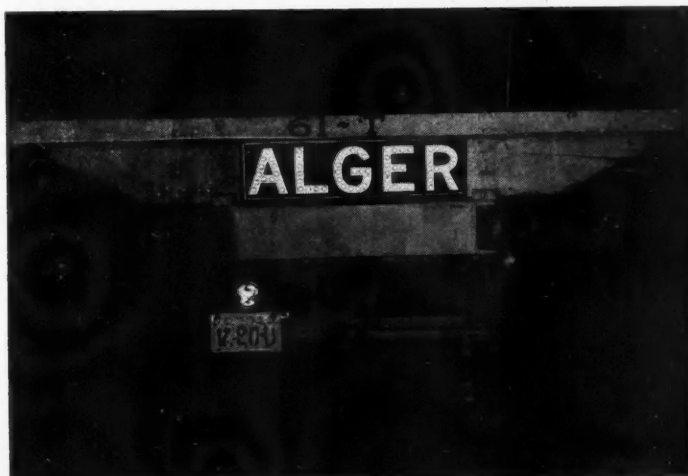
The rear end of the shop is devoted to major repairs, including replacement of motors, transmission or clutch and relining of brakes. Sometimes temporary work is done on a truck needing major repairs in the interest of expediency, but as soon as the unit is available, it is pulled out of service for overhauling. Major repairs require a week to 10 days.

To cross check on all major maintenance items, a card index and a ledger page are set up for each truck and kept up-to-date in the shop office. The ledger page carries a line for each maintenance operation and whenever that operation is carried out, the date of its completion is

(TURN TO PAGE 140, PLEASE)

GEO. F. ALGER CO.		MANIFEST	
DATE		Finished	
DATE		Started	
Loading Driver		Delivering Driver	
Truck No.		Trailers	
Shipper			
Consigned to			
Point of Origin		Destination	
Contents		Weight	
Route		Miles one way	
DATE		HOUR	
GARAGE - Leave		Purchased	
Arrive		GASOLINE Garage	
Leave		Total	
Arrive		Avg. Miles Per Gal.	
Leave		Earnings	
Arrive		Driver Cost	
Leave		Gasoline Cost	
Arrive		Est. Operating Cost	
Leave		Total	
GARAGE - Arrive		In	
Out		Out	
Total Elapsed Time		Actual Running Time	
REMARKS - Complete description of idle time, delays, road conditions, loading and unloading conditions:			
Form 102 - 4 - 10/10/1939			

Your average running time from Detroit to the following points should be:	
Monroe	1 1/2
Toledo	2 1/2
Sandusky	5
Clyde	4
Monroeville	4 1/2
Mansfield	7
Cleveland	8
Canton	9
Youngstown	10
Wapakoneta	7
Dayton	9
Middletown	10
Pontiac	1 1/2
Moscow	2 1/2
Flint	3 1/2
Saginaw	4 1/2
Bay City	5
Petoskey	10
Pat's Concen	2 1/2
Lansing	4 1/2
Ionia	6
Greenville	8
Grand Rapids	8
Muskegon	10
Ann Arbor	2
Chelsea	2 1/2
Jackson	4
Battle Creek	5 1/2
Kalamazoo	8
Beaumont Harbor	10
Clark & Station	
Territorial	



WHITE POWER PILOT

Has finger-tip control; automatically shifts two-speed axle

THE White Motor Co., has introduced the White Power Pilot as a result of its findings that two-speed axles were not being put to proper use mainly because of the difficulty encountered in shifting from one ratio to the other.

Due to the fact that there is already protruding through the cab floor the conventional gear shift lever and hand brake lever, it was necessary to place the two-speed shift lever on the extreme right in a position that was neither convenient nor safe for the driver to use. The hazard was that the driver had to reach to the extent that he was no longer directly behind the steering wheel and in some cases it was necessary that he look away from the road. There were not a great many drivers who would go to the inconvenience of making the shift because it was difficult and required expert manipulation of the clutch pedal, shift lever and accelerating treadle. Especially was this true when the driver knew the route to the extent of realizing that in a very short distance it would again be necessary to shift the axle back into its former speed. The overall result was that two-speed axles were being operated in the low gear for longer periods than necessary. Thus the truck over a given route would have more motor miles than was absolutely required to negotiate the terrain encountered.

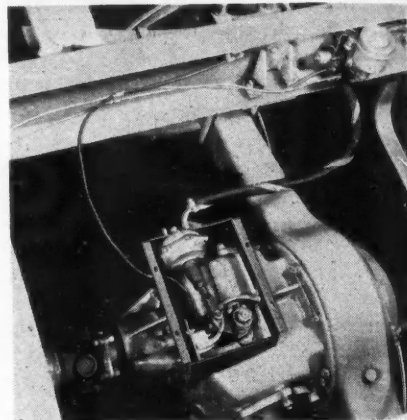
The Power Pilot is applied to a two-speed axle of the double reduction type. This type of axle has a primary reduction consisting of a spiral bevel set of gears, the ring gear of which drives a cross shaft. Running free on this cross shaft are two helical spur driving pinions which mate with helical spur gears mounted on the differential case and accomplish secondary reductions of different ratios.

Inserted between the two driving pinions is a clutch collar which is driven by the cross shaft by means

of splines on which the collar is free to slide in both directions. The pinions have on the sides adjacent to the collar corresponding splines or teeth, thus either pinion may be engaged to the shaft by sliding the collar into mesh with the splines on the pinion. This movement is accomplished by a conventional shifter fork and is operated by a small lever on the exterior of the differential carrier. It is the lever to which the Power Pilot control is directly applied. This is accomplished by having a vacuum diaphragm which pulls the lever to a position which causes the clutch collar to engage the driving pinion. In doing this the diaphragm compresses a spring which, when the vacuum is released, pushes the lever in the opposite position, thus engaging the high gear pinion.

The vacuum diaphragm is controlled by a solenoid operated valve which in one position connects the diaphragm with the engine manifold and in the other position vents the diaphragm to atmospheric pressure.

Mounted on the steering column is a control box having two contact



Top—The control box is mounted on the steering post within finger-tip reach. Above—The main unit is shown mounted on the axle housing. Note the simplicity of the units hook-up

buttons which, when depressed, energize the solenoid. There is also a small pilot light on this control box which is illuminated when the axle is in the high gear. This circuit is closed by means of a contact switch actuated by the lever on the exterior of the rear axle differential case. The purpose of this light will be described later.

The procedure of operation of the Power Pilot is as follows:

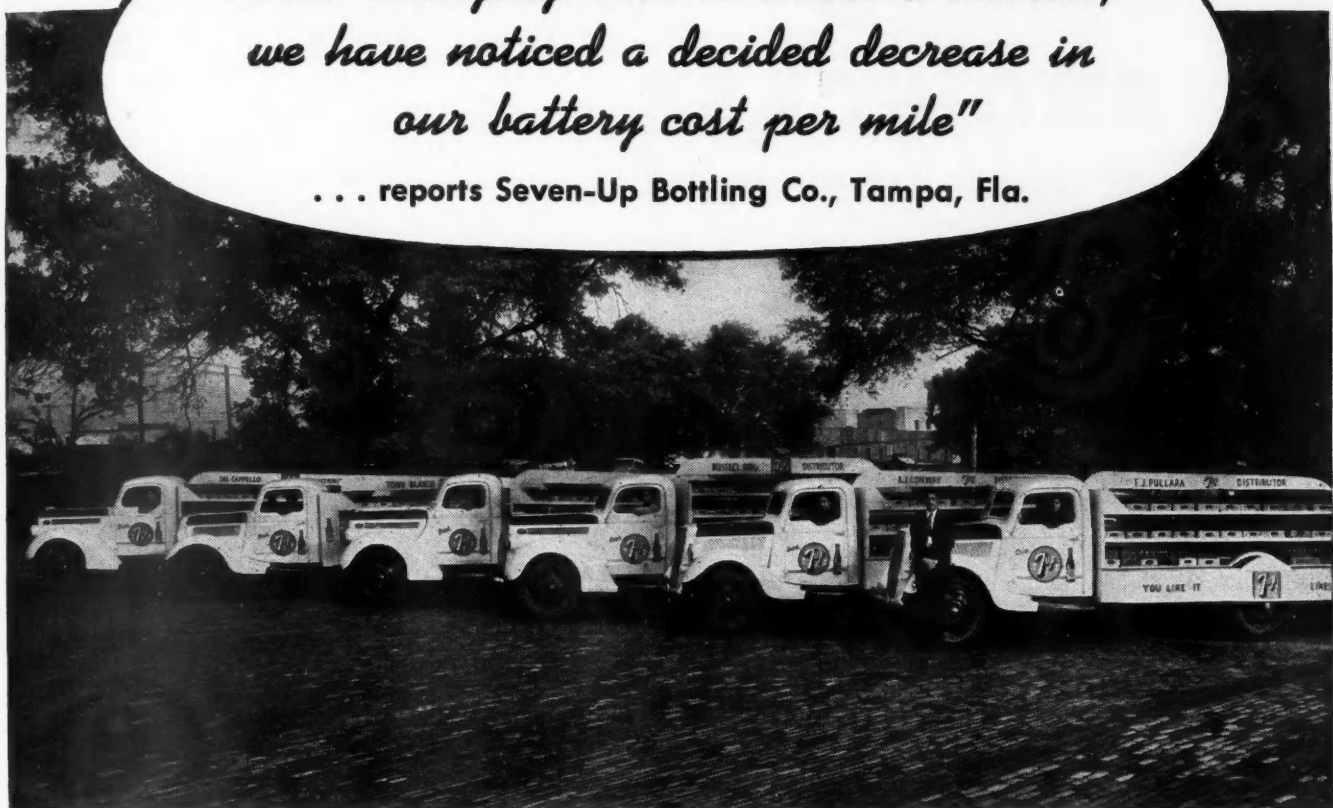
(TURN TO PAGE 83, PLEASE)



Ford's new frontal design for 1942 features a rustless steel radiator grille which blends into a new arrangement of headlight and parking lights. Available in three models: special, deluxe and super-deluxe. The latter two are offered with either the V8 or the new "6" engine

*"Since changing over to Exide Batteries,
we have noticed a decided decrease in
our battery cost per mile"*

... reports Seven-Up Bottling Co., Tampa, Fla.



Six of the 22 cars and trucks, all Exide-equipped, operated by the Seven-Up Bottling Company, Tampa, Fla.

FOR the past three and a half years, the entire fleet of 22 trucks and cars operated by the Seven-Up Bottling Company in and around Tampa, Fla., has been equipped with Exide Batteries.

According to Mr. C. W. Bray, an official of Seven-Up, this busy fleet has run at decidedly lower battery cost per mile ever since Exides were installed. And he speaks enthusiastically about the "wonderful service" given by these dependable Exide Batteries.

Similar savings and similar reliability are reported by operators of Exide-equipped fleets all over the country. No wonder... for Exide Batteries are today built to give longer service life than ever before... and there's an Exide engineered to provide top-notch performance in every size and type of motor vehicle. There are also Exides with wood and fibreglas separators for "cycling" service.

Want to cut *your* battery costs per mile? See your Exide Distributor today.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Exide
HEAVY-DUTY
TRUCK BATTERIES



SHOWCASE OF NEW PRODUCTS



Rustproof Process

Galv-Weld, Inc., Dayton, Ohio, is distributor of the alloy metals necessary for the Galv-Weld process. Using the correct al-



loy a mechanic takes a stick of the material and rubs a welded joint or spot, still hot from the welding, and it is covered with a galvanized coating. The joint can be painted or baked and it will not peel.

Infra-Red Drying Lamps

These inside-silvered carbon filament lamps have been especially developed for Infra-red ray processes in drying, baking, heating, and dehydrating. The pure, polished silver in the base end of the lamp acts as a reflector to project the Infra-red

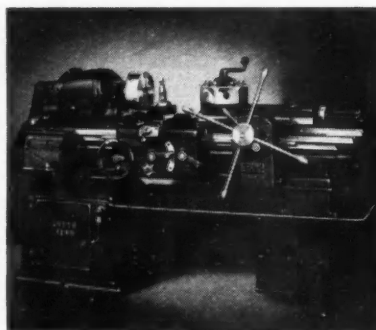


rays toward the surface being worked on. The manufacturer claims that the red-way emanation from the carbon filament falls in the more desirable band on the Angstrom scale for maximum drying efficiency. They are available in the model R-40, 250-watt, 110-120 volts, at \$1.75. Clear glass Infra-red lamps requiring separate reflectors are also available in the model PS-30 and the G-25 at \$0.75 from North American Electric Lamp Co., St. Louis, Mo.

Turret Lathe

This 16-in. swing turret lathe designed for rapid chucking and bar work has been announced by the South Bend Lathe Works, South Bend, Ind. This lathe has a 16¼-in. swing over the bed ways and saddle wings, 9½-in. swing over the tool post saddle cross slide, 1½-in. hole through the headstock spindle and 1-in. capacity through the collet.

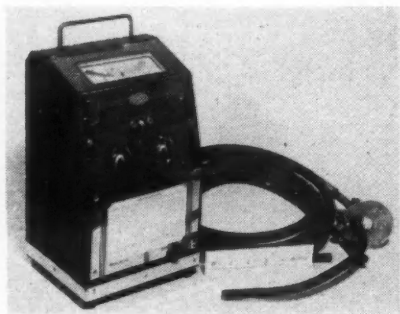
The ram type turret has both power feed and hand feed, with automatic indexing and individual stop for each of the six



turret faces. Twelve spindle speeds ranging from 10 to 731 r.p.m. are available. A two-speed motor permits quick change from high to low speed for reaming and tapping operations.

Portable Exhaust Gas Tester

This compact, portable instrument analyzes the exhaust gas while the engine of the vehicle is working in the garage or on the road. The usual hook-up is ac-



complished by inserting the sampling tube into the tail pipe of the vehicle, and the pointer on the scale of the tester shows instantly the composition of the mixture supplied to the carburetor. When used for testing under driving conditions, the indicator pointer will not jump or waver because of its design, it is claimed by the maker, Cambridge Instrument Co., New York, N. Y.

Fast Charger

A new model 90 fast charger has been added to the line of the Baldor Electric Co., St. Louis, Mo. Known as the "Rect-O-Lyzr," the unit weighs 210 lbs. and is mounted on rubber-tired wheels for easy portability. The charger tests each cell of a battery separately and charges at auto-



atically tapered rates. The starting rate is 80 amps., gradually dropping to 50 amps., when the charge is 60 per cent complete, and later to a soaking rate of 15 amps.

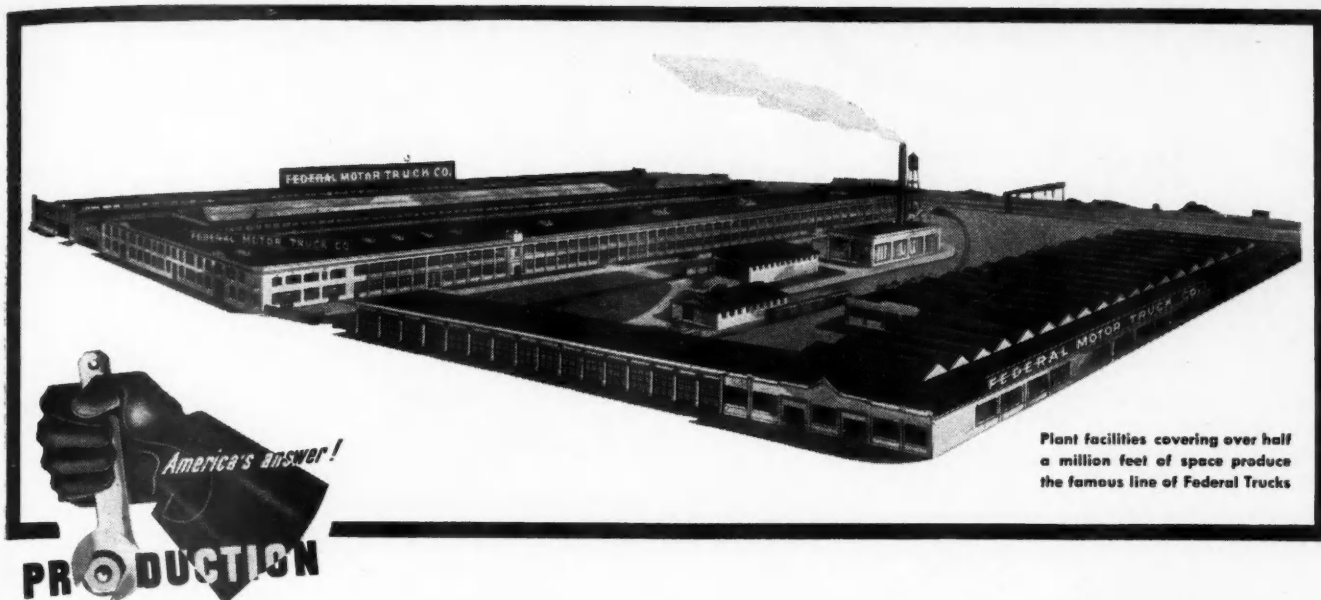
Equipped with oversize transformers, specially designed clips and conveniently placed dials, the charger is available in two models, F-10 and F-20, of 110 and 220 voltage respectively. Price is \$198.

Truck Heaters

Eclipse truck heaters designed to give adequate protection for cargoes for 12 to 24 hours depending upon conditions, are made in two sizes. One holds 7 lbs. of charcoal and the other holds 10 lbs. The diameter of the small one is 15 in. and the height is 19 in. The larger is 16 in. by 23 in. The prices are \$6 and \$8 from the Eclipse Metal Mfg. Co., Eden, New York.

New Alloyed Oil

A new oil for heavy duty service in trucks, buses, tractors and other motorized equipment, both gas and diesel powered, is announced by Quaker State Oil Refining Corp., Oil City, Pa. This product, known as Quaker State HD, is an alloyed oil possessing greater strength and durability. It resulted from experiments in which the company started with 100 per cent Pennsylvania crude oil and added alloying ingredients to improve its characteristics.



Plant facilities covering over half a million feet of space produce the famous line of Federal Trucks

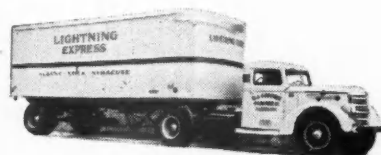
FEDERAL IS BUILDING MILLIONS OF DOLLARS OF DEFENSE TRUCKS FOR UNCLE SAM—



Greater payload capacity and increased earnings are made possible by the shorter over-all length of Federal Cab-Over-Engine units.



Federal's extra duty design and functional on-the-job fitness, aid owners in holding maintenance costs to a minimum.



The answer to lower ton-mile cost is demonstrated by Federal's insistence on the highest standards of truck construction.

Stability through sound growth built Federal's ample factory facilities . . . today provides the capacity to keep pace with the ever mounting needs of both Industry and Defense.

Since 1910 Federal has manufactured motor trucks exclusively . . . has built into its product the dependability demanded by every conceivable road and load condition . . . now provides in every essence those factors of lower operating upkeep, longer life, and greater stamina.

Federal Trucks are available in the widest range of models and types—from light to highest tonnage capacities—in conventional, cab-over-engine and also in special designs for unusual transport needs. They are working in every field of transportation throughout the world—serving the largest corporations, the smallest companies, big fleet owners, individual farmers with equal distinction, unsurpassed economy—will do the same for you.

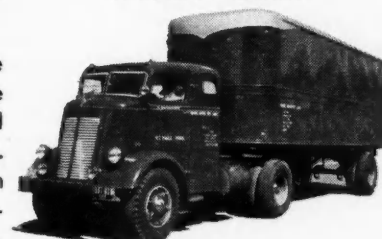
Consult your nearest Federal Dealer—or write our Sales Engineering Department for on-the-job recommendations.

FEDERAL MOTOR TRUCK CO.
Detroit • Michigan

FEDERAL Trucks
SINCE 1910
KNOWN IN EVERY COUNTRY • SOLD ON EVERY CONTINENT



Federal's proved dependability is a guarantee of on-time deliveries, regardless of highway or weather conditions.



The structural ruggedness of Federal trucks is reflected in their unflinching performance under the most exacting load and road requirements.



Federal's unexcelled maneuverability and handling ease in heavy traffic cuts down hauling time and driving strain.

QUALITY TRUCKS AT PRODUCTION PRICES

OPM PRIORITY PLAN

(CONTINUED FROM PAGE 35)

(2) "Truck-trailer" means a complete semi-trailer or full trailer having a cargo-carrying capacity (as advertised by the Producer prior to Aug. 1, 1941) of five ton or more, designed exclusively for the transportation of property, or the chassis or body therefor.

(3) "Passenger Carrier" means a complete motor or electric coach for passenger transportation, having a seating capacity of not less than 15 persons, or the chassis or body therefor.

(4) "Defined Parts" means only the following functional parts (including components entering into such parts) used for the manufacture or repair of heavy trucks, medium trucks, truck-trailers and passenger carriers; engine, clutch, transmission, propeller shaft, axles, brakes, wheels, hubs, drums, starting apparatus, spring suspension, brackets and shackles; gages, speedometers, motors, fuses, flares, directional signals, rear-view mirrors, windshield wipers, control mechanisms, steering apparatus, driving gears, coupling devices; also the exhaust, cooling, fuel and electrical systems, including generators, lights, reflectors and batteries; and, but only as to parts for passenger carriers, heating, ventilating and door-opening equipment.

(5) "Producer" means any individual, partnership, association, corporation or other form of business enterprise, engaged in the manufacture of Motor Trucks, Truck-Trailers, Passenger Carriers or Defined Parts.

(b) *General Restriction.* During the period commencing Sept. 1, 1941, and ending Nov. 30, 1941.

(1) A producer shall not manufacture more than one-half the number of Medium Motor Trucks, Truck-Trailers and Passenger Carriers, as the case may be, produced by him during the period from Jan. 1, 1941, to June 30, 1941.

(2) A producer shall not manufacture, for replacement purposes, more than 60 per cent of that number of Defined Parts sold by him for replacement purposes during the period from Jan. 1, 1941, to June 30, 1941.

(3) The determination of the number of each category of vehicles produced, or of each category of parts sold, during the period from Jan. 1, 1941, to June 30, 1941, shall exclude, and the foregoing limitation upon the number of each category of vehicles or parts which may be produced by any Producer during the three-month period, Sept. 1, 1941, to Nov. 30, 1941, shall not apply to any such vehicles or parts produced under contracts or orders for delivery to or for the account of:

(i) the Army or Navy of the United States, the United States Maritime Commission, the Panama Canal, the Coast and Geodetic Survey, the Coast Guard, the Civil Aeronautics Authority, the National Advisory Commission for Aeronautics, the Office of Scientific Research and Development;

(ii) the government of any of the following countries; the United Kingdom, Canada, and other Dominions, Crown Colonies and Protectorates of the British Empire, Belgium, China, Greece, the Kingdom of the Netherlands, Norway, Poland, Russia and Yugoslavia;

(iii) any agency of the United States Government for material or equipment to be delivered to, or for the account of, the government of any country listed above, or any other country, including those in the Western Hemisphere, pursuant to the Act of March 11, 1941, entitled "An Act to Promote the Defense of the United States." (Lend-Lease Act.)

(4) Each Producer must comply with such directions and instructions as may be issued from time to time by the Director of Priorities of the Office of Production Management with respect to the reduction or elimination of scarce materials in the production of motor trucks, truck-trailers, passenger carriers and parts or components therefor.

(c) *Records.* All persons affected by this Order shall keep and preserve for not less than two years accurate and complete records concerning inventories, production and sales.

(d) *Audit and Inspection.* All records required to be kept by this Order shall, upon request, be submitted to audit and inspection by duly authorized representatives of the Office of Production Management.

(e) *Reports.* All persons affected by this Order shall execute and file with the Office of Production Management such reports and questionnaires as said Office shall from time to time request. No reports or questionnaires are to be filed by any person until forms therefor are prescribed by the Office of Production Management.

(f) *Violations or False Statements.* Any person who violates this Order, or who wilfully falsifies any records which he is required to keep by the terms of this Order, or by the Director of Priorities, or otherwise wilfully furnishes false information to the Director of Priorities or to the Office of Production Management may be deprived of priorities assistance or may be prohibited by the Director of Priorities from obtaining any further deliveries of materials subject to allocation. The Director of Priorities may also take any other action deemed appropriate, including the making of a recommendation for prosecution under section 35A of the Criminal Code (18 U.S.C. 80).

(g) *Appeal.* Any person affected by this Order who considers that compliance herewith would work an exceptional and unreasonable hardship upon him, may appeal to the Division of Priorities by addressing a letter to the Automotive Branch of the Division of Civilian Supply, Office of Production Management, Washington, D. C., setting forth the pertinent facts and the reasons such person considers that he is entitled to relief. The Director of Priorities may thereupon take such action as he deems appropriate.

(h) *Effective Date.* This Order shall take effect upon the date of the issuance thereof and shall continue in effect until revoked by the Director of Priorities subject to such

amendments or supplements thereto as may be issued from time to time by the Director of Priorities.

(P.D. Reg. 1, Aug. 27, 1941, 6 F.R. 4489; OPM Reg. 3, March 8, 1941, 6 F.R. 1596; E.O. 8629, Jan. 7, 1941, 6 F.R. 191; E.O. 8875, Aug. 28, 1941, 6 F.R. 4483; sec. 2(a), Public No. 671, 76th Congress, Third Session, as amended by Public No. 89, 77th Congress, First Session; sec. 9, Public No. 783, 76th Congress, Third Session.) Issued the 12th day of September, 1941.

(Signed) Donald M. Nelson

Director of Priorities

TITLE 32—NATIONAL DEFENSE (PM 1152)

CHAPTER IX—OFFICE OF PRODUCTION MANAGEMENT

Subchapter B—PRIORITIES DIVISION
Part 976—Motor Trucks, Truck-Trailers and Passenger Carriers

LIMITED PREFERENCE RATING ORDER NO. P-54

Material Entering Into the Production of Defense Products:

976.2 PREFERENCE RATING ORDER.

For the purpose of facilitating the acquisition of material for the production of certain trucks, trailers, passenger carriers and of certain parts thereof, a preference rating is hereby assigned to deliveries for such purposes upon the following terms:

(a) *Definitions:* For the purpose of this Order:

(1) "Producer" means any individual, partnership, association, corporation, or other organization, engaged in the production of any of the products listed below entitled "Defense Products."

(2) "Defense Products" means any of the following items to be produced by the Producer:

(i) "Heavy Motor Truck" means a complete motor truck or truck-tractor of a rated capacity (as advertised by the Producer prior to Aug. 1, 1931), of three tons or more, or the chassis, body or cab therefor.

(ii) "Medium Motor Truck" means a complete motor truck or truck-tractor of a rated capacity (as advertised by the Producer prior to Aug. 1, 1941) of one and one-half tons or more, but less than three tons, or the chassis, body or cab therefor.

(iii) "Truck-trailer" means a complete semi-trailer or full trailer having a cargo-carrying capacity (as advertised by the Producer prior to Aug. 1, 1941) of five tons or more, designed exclusively for the transportation of property, or the chassis or body therefor.

(iv) "Passenger Carrier" means a complete motor or electric coach for passenger transportation, having a seating capacity of not less than 15 persons, or the chassis or body therefor.

(v) "Defined Parts" means only the following functional parts (including components entering into such parts) used for the manufacture or repair of heavy trucks, medium trucks, truck-trailers and passenger carriers; engine, clutch, transmission, propeller shaft, axles, brakes,

(TURN TO PAGE 134, PLEASE)



"A. W." QUALITY SHEETS

From Mine to Consumer . . . Carbon, Copper or Alloy Sheets—in any open hearth analysis to meet your specifications. Welding qualities, toughness, abrasion resistance, ductility . . . Ingots, Billets, Blooms, Slabs, Sheared Plates, Hot Rolled Sheets. Floor Plates for every flooring need. Steel Cut Nails in all types and sizes. "Swede" Pig Iron—Foundry, Malleable, Basic, Bessemer. "A. W." Products have been an accepted standard for steel buyers for more than a century.

ALAN WOOD STEEL COMPANY, CONSHOHOCKEN, PA.

SINCE 1826 : : DISTRICT OFFICES AND REPRESENTATIVES — Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, New Orleans, St. Paul, Pittsburgh, Roanoke, Sanford, N. C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal.

NEWSCAST



National Truck Show Dec. 6 at Philadelphia

The Eighth Annual National Highway Transportation Show will be held in Philadelphia, Pa., in Convention Hall, Dec. 6 to 12 inclusive. The show will feature a display of trucks, trailers, tanks, tractors, passenger cars, road building equipment, mobile kitchens, sterilizer units, diesel and gas engines, third axles, accessories and equipment, ambulances, buses, etc. Much new defense equipment not yet seen by the public will be displayed, according to the board of directors of the National Motor Truck Show, Inc., sponsor of the exhibit.

National Participation Show Not Favored by A.M.A. Group

Because of defense and related production in motor truck plants, the Motor Truck Committee of the Automobile Manufacturers Association has unanimously adopted a recommendation against participation by the motor truck manufacturers in national shows.

Truck manufacturers in the association deemed it advisable to make their position clear at this time in view of the fact that they voted against holding a show under the sponsorship of the association and because of proposals that have been received from outside which seek to promote shows of this kind. The position of the motor truck manufacturers follows that adopted in January by the directors of the Automobile Manufacturers Association with respect to a National Automobile Show this year.

TRUCK PRODUCTION (U. S. and Canada)

	1941	1940	Per Cent Change
January*	100,835	74,016	+35.0
February*	104,172	71,690	+45.5
March*	111,587	75,285	+48.1
April*	102,784	76,807	+33.9
May*	117,817	74,139	+58.8
June*	118,757	67,787	+75.2
July*	121,160	74,005	+63.5
7 Months*	777,112	513,729	+51.3
August*		41,533	
September*		56,703	
October*		86,104	
November*		93,068	
December*		98,747	
Total*		899,884	

*1941 data revised.

Truck Production

This is a good year for trucks, as if you didn't know. The production figures on this page tell their own story. Note that the seven-month total shows a 51 per cent increase over the same period last year. Canadian production alone increased better than 100 per cent.

ATA Safety and Operations Meeting

A panel of five personnel problems will be discussed by the Safety and Operations Section of the ATA when it meets Oct. 28 and 29 in New York City during the ATA convention. The subjects are: "Growing Shortage of Driving and Mechanical Personnel," by Chas. G. Morgan; "New Driver Selection and Training Methods," by R. J. Olson; "New Personnel Problems in the Shop"; "New Personnel Problems on



Ben B. Settle will have charge of all factory and field service on Dodge passenger cars and trucks in his new capacity as Director of Service of the Dodge organization.

the Platform." The Equipment and Maintenance session will be highlighted by a talk on "Increasing the Efficient Use of Existing Equipment," by D. L. Sutherland (Middle Atlantic Trans. Co., N. Y. C.); "New Maintenance Problems Arising from Increased Exposure and Use of Substitute Materials," R. G. Riley (Thompson Products Co.); "If Fuel Rationing Comes," by Errol Gay (Ethyl Gasoline Corp.).

National Safety Council Exposition

This year the Safety Congress will be held in Chicago, week of Oct. 6, at the Stevens Hotel. Subjects and speakers at the Commercial Vehicles Section will be:


"A State Government's Responsibility for Safety," by Hon. M. D. Van Wagoner, Governor of Michigan; "Value of Transportation Company Participation in a Community Safety Program," by D. L. Fennell; "Commercial Vehicle Safety and Defense," by Ted. V. Rogers; "Driver Selection and Training in War Time," by R. C. Haven; "The Doctor Looks Him Over," by W. S. Lawrence; "A Practical Road Test Plan," by A. E. Neyhart; "Brakes—Their Performance and Maintenance," by J. D. Roach; "Control of Maintenance of a Scattered Fleet," by H. O. Mathews; "Load Distribution Factors," by Don Wilson; "Safe Driving Through Safe Routing" (a panel discussion); "Helping Drivers by Reviewing Their Accidents," by E. D. Jackson; "Teaching Safety Through First Aid Training," by Roy D. Day; "Directing a Fleet of 600 Women Drivers by Remote Control," by W. Graham Cole. The presentation of safety awards will be made by L. J. Sorenson, Secretary of the Navy. Frank Knox will discuss the "Significance of National Safety."

Two S.A.E. Transportation Meetings in November

Two transportation and maintenance meetings have been planned for November by the T & M Activity of the Society of Automotive Engineers. A West Coast (TURN TO PAGE 64, PLEASE)

New Truck Registrations by Makes by Months

	Auto-car	Brock-way	Chevrolet	Diamond T	Dodge	Federal	Ford	G.M.C.	Hudson	Inter-nat'l	Mack	Plymouth	Reo	Sterling	Studebaker	White	Willys	Misc.	Total
January..... 1941	189	155	15,801	447	4,496	120	15,797	3,338	85	7,445	673	886	79	34	231	682	82	300	50,830
January..... 1940	139	117	15,574	535	4,343	152	13,222	3,046	56	5,480	571	718	11	22	85	433	173	326	45,003
February..... 1941	139	128	15,778	436	4,141	136	16,531	3,118	63	6,992	532	747	90	35	231	658	82	287	50,124
February..... 1940	94	92	13,789	425	4,336	113	11,960	2,638	60	4,981	425	767	4	31	101	380	182	351	40,729
March..... 1941	215	175	21,053	583	5,354	112	18,662	3,950	85	8,504	796	1,023	138	33	383	802	168	377	62,413
March..... 1940	138	123	17,702	573	5,355	161	14,962	3,444	76	6,897	533	949	6	24	154	556	233	310	52,290
April..... 1941	250	229	22,497	701	6,038	137	16,789	4,267	94	9,129	931	1,041	154	48	475	918	188	352	64,236
April..... 1940	154	102	18,996	563	5,650	152	15,416	3,503	91	7,027	655	1,070	7	35	133	763	222	307	54,846
May..... 1941	228	244	22,332	561	6,012	156	17,290	4,224	84	9,023	903	1,066	157	43	434	811	252	357	64,177
May..... 1940	158	143	16,735	501	5,453	151	13,769	3,704	92	6,715	758	1,064	6	25	112	582	225	374	50,543
June..... 1941	237	179	21,722	507	5,951	114	17,325	3,800	86	8,580	851	904	135	32	456	835	214	337	62,265
June..... 1940	126	121	13,835	533	4,374	116	11,599	2,953	67	6,239	560	902	20	30	103	558	188	209	42,533
July..... 1941	262	250	22,893	595	6,629	158	18,122	4,543	71	9,531	1,055	883	150	54	526	1,047	226	437	67,412
July..... 1940	160	153	15,805	642	4,891	121	14,296	3,261	64	7,012	718	999	78	28	77	489	248	231	49,053
Seven Months..... 1941	1,520	1,360	142,076	3,830	38,621	933	120,516	27,290	548	59,204	5,741	6,510	903	279	2,736	5,733	1,210	2,447	421,457
Seven Months..... 1940	985	851	112,526	3,772	34,202	986	95,224	22,549	506	44,351	4,218	6,469	132	195	765	3,721	1,471	2,114	334,997
% Change... 7 Months	+57	+60	+26	+2	+12	-4	+26	+21	+8	+33	+36	+1	+584	+43	+257	+54	-18	+15	+25



TRUCK

SPECIFICATIONS

TABLE

OF

STANDARD

DOMESTIC

MODELS

TABULATED BY

COMMERCIAL CAR JOURNAL

and brought up to date in this issue
from data supplied by manufacturers

KEY TO DEFINITIONS, ABBREVIATIONS AND REFERENCES	
DEFINITIONS	KEY TO REFERENCES
MAKE AND MODEL	c.f.—Cab Forward design.
OPTIONAL UNITS	c.o.e.—Cab-Over-Engine design.
For the express purpose of best fitting the truck to the individual job most of the models listed can be provided with optional engines, transmissions, axles, etc., and these models when so equipped are considered standard stock models.	(C)—Converted Ford or Chevrolet model.
CHASSIS LIST PRICE	ei, identifiable by engine make listed.
The chassis list price applies to the minimum standard wheelbase with standard tires and standard equipment. All prices are F.O.B. factory. Chassis list price includes the price of the Cab unless otherwise noted.	(D)—For dump or tractor service only.
RECOMMENDED GROSS WEIGHT FOR NORMAL SERVICE	(D)—Diesel-engine equipped.
The Gross Weights published herein are those supplied by manufacturers as their Recommended Gross Vehicle Weights for Normal Operating Conditions, and are based upon the Maximum Authorized Tire Size listed. In actual use, the gross weight may increase or decrease the gross vehicle weight rating when either favorable or unfavorable operating conditions are involved. Since the proper performance of a motor truck depends upon many factors, including load, road conditions, etc., the gross weights that a manufacturer is prepared to recommend will vary with particular conditions, and the manufacturer's own standard of safety factors. Specific recommendations, therefore, are given for each model from the manufacturer's representative.	e.b.s.—Engine-between-seat design.
	e.u.s.—Engine-under-seat design.
	(N)—Not available as a tractor.
	(T)—Designed for tractor use only.
	(3) Available—All models available in c.o.e. design, oversize power plants, oil engines and six-wheel construction.
	(5) Concord—These models available with double drop bus frames.
	(6) Federal—245 cu. in. engine and 11" clutch available on Models 16 and 76.
	283 cu. in. engine available on Models 16, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.
	55, 92 and 94, 428 cu. in. and 501 cu. in. engines available on Models 45, 517 cu. in. oversize or two-speed rear axles available on Models 45, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600.
	Double reduction rear axles available on Models 20, 25, 29, 35, 45, 80, 85, 89, 90 and 92. Two- or three-speed auxiliary transmissions available on Models 20, 25, 29, 35, 45, 80, 85, 89, 90, 92, 93, 94, 95, 96, 97, 98, 99, 100.
	(9) Gramm—Models 31, 41, 46, 54, 71, 76, 88 and 96 both gasoline and diesel engine available on Models 31, 41, 46, 54, 71, 76, 88 and 96. 221 cu. in. engine available on Model 21. 203 cu. in. engine available on Models 31 and 41. 282 cu. in. engine and 5 speed transmission available on Models 41, 46, and 56. 340 cu. in. engine and 5 speed transmission available on Models 41, 46, 56, and 71. 404 cu. in. engine and larger 5 speed transmission available on Model 88. Oversize two speed and double reduction axles available on Models 21, 31, 41, 46, 54, 71, 76, 88, 90, 92, 93, 94, 95, 96, 97, 98, 99, 100. line and diesel. All other equipment furnished at extra cost.
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	(16) Sterling—Diesel powered unit of comparable capacity available in addition to gasoline models.
	(18) Willys—Advertised list price less Federal tax. Cab Pick-up \$732; Panel Delivery \$950. Prices complete with standard equipment. Standard urea 2-ply/19" ply. Panel Delivery 6.00/16—4 ply; 6.00/16S—6 ply—optional.
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B—Bendis.	C—Center of double propeller shaft.
BL—Burr-Lipe.	2/4—Two-wheel brakes effective on all four wheels.
Bu or Bud—Buda.	4—Four wheels.
Cat—Caterpillar.	6—Six wheels.
Cl or Cla—Clark.	T—Transmission.
C or Chev—Chevrolet.	F—Driveshaft.
Co—Columbia.	P—Propeller shaft.
Col—Columbia.	
Cum—Cummins-Diesel.	
Est—Easton.	
F—Fowler.	
Fu—Fulmer.	
Her—Hermules.	
L—Lockheed.	
LO—Lockheed front, Own rear.	
LW—Lockheed front, Wisconsin rear.	
N—Nash.	
N.P.—Nash-Peas.	
O or Ow—Own.	
Op or Opt—Optional.	
Sal—Salsbury.	
Shu—Shuler.	
Sp—Spicer.	
T—Timken.	
TO—Timken front, Own rear.	
TW—Timken-Wisconsin.	
W—Warner Gear.	
WG—Wisconsin Herrington.	
W-Her—Waukegan Herrington.	
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Wau—Waukegan.	
W or Wis—Wisconsin.	
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For the express purpose of best fitting the truck to the individual job most of the models listed can be provided with optional engines, transmissions, axles, etc., and these models when so equipped are considered standard stock models.	(C)—Converted Ford or Chevrolet model.
CHASSIS LIST PRICE	ei, identifiable by engine make listed.
The chassis list price applies to the minimum standard wheelbase with standard tires and standard equipment. All prices are F.O.B. factory. Chassis list price includes the price of the Cab unless otherwise noted.	(D)—For dump or tractor service only.
RECOMMENDED GROSS WEIGHT FOR NORMAL SERVICE	(D)—Diesel-engine equipped.
The Gross Weights published herein are those supplied by manufacturers as their Recommended Gross Vehicle Weights for Normal Operating Conditions, and are based upon the Maximum Authorized Tire Size listed. In actual use, the gross weight may increase or decrease the gross vehicle weight rating when either favorable or unfavorable operating conditions are involved. Since the proper performance of a motor truck depends upon many factors, including load, road conditions, etc., the gross weights that a manufacturer is prepared to recommend will vary with particular conditions, and the manufacturer's own standard of safety factors. Specific recommendations, therefore, are given for each model from the manufacturer's representative.	e.b.s.—Engine-between-seat design.
	e.u.s.—Engine-under-seat design.
	(N)—Not available as a tractor.
	(T)—Designed for tractor use only.
	(3) Available—All models available in c.o.e. design, oversize power plants, oil engines and six-wheel construction.
	(5) Concord—These models available with double drop bus frames.
	(6) Federal—245 cu. in. engine and 11" clutch available on Models 16 and 76.
	283 cu. in. engine available on Models 16, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.
	55, 92 and 94, 428 cu. in. and 501 cu. in. engines available on Models 45, 517 cu. in. oversize or two-speed rear axles available on Models 45, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600.
	Double reduction rear axles available on Models 20, 25, 29, 35, 45, 80, 85, 89, 90 and 92. Two- or three-speed auxiliary transmissions available on Models 20, 25, 29, 35, 45, 80, 85, 89, 90, 92, 93, 94, 95, 96, 97, 98, 99, 100.
	(9) Gramm—Models 31, 41, 46, 54, 71, 76, 88 and 96 both gasoline and diesel engine available on Models 31, 41, 46, 54, 71, 76, 88 and 96. 221 cu. in. engine available on Model 21. 203 cu. in. engine available on Models 31 and 41. 282 cu. in. engine and 5 speed transmission available on Models 41, 46, and 56. 340 cu. in. engine and 5 speed transmission available on Models 41, 46, 56, and 71. 404 cu. in. engine and larger 5 speed transmission available on Model 88. Oversize two speed and double reduction axles available on Models 21, 31, 41, 46, 54, 71, 76, 88, 90, 92, 93, 94, 95, 96, 97, 98, 99, 100. line and diesel. All other equipment furnished at extra cost.
	(10) Corbitt—Wheelbases optional—any wheelbase desired furnished at chassis price listed.
	(11) International Harvester—By normal operating conditions (see Normal Service) is meant operation on comparatively level terrain, over roads with a tractive resistance value of from 25 to 30 pounds per ton of gross vehicle weight and at controlled and uniform speeds within a range of not to exceed 45 m.p.h.
	(12) Sterling—Available with double reduction rear axle.
	(16) Sterling—Diesel powered unit of comparable capacity available in addition to gasoline models.
	(18) Willys—Advertised list price less Federal tax. Cab Pick-up \$732; Panel Delivery \$950. Prices complete with standard equipment. Standard urea 2-ply/19" ply. Panel Delivery 6.00/16—4 ply; 6.00/16S—6 ply—optional.
KEY TO ABBREVIATIONS	
MAKES—ALL	BRACKES—HAND
B—Bendis.	C—Center of double propeller shaft.
BL—Burr-Lipe.	2/4—Two-wheel brakes effective on all four wheels.
Bu or Bud—Buda.	4—Four wheels.
Cat—Caterpillar.	6—Six wheels.
Cl or Cla—Clark.	T—Transmission.
C or Chev—Chevrolet.	F—Driveshaft.
Co—Columbia.	P—Propeller shaft.
Col—Columbia.	
Cum—Cummins-Diesel.	
Est—Easton.	
F—Fowler.	
Fu—Fulmer.	
Her—Hermules.	
L—Lockheed.	
LO—Lockheed front, Own rear.	
LW—Lockheed front, Wisconsin rear.	
N—Nash.	
N.P.—Nash-Peas.	
O or Ow—Own.	
Op or Opt—Optional.	
Sal—Salsbury.	
Shu—Shuler.	
Sp—Spicer.	
T—Timken.	
TO—Timken front, Own rear.	
TW—Timken-Wisconsin.	
W—Warner Gear.	
WG—Wisconsin Herrington.	
W-Her—Waukegan Herrington.	
W-Her—Waukegan Herrington.	
Wau—Waukegan.	
W or Wis—Wisconsin.	
WO—Wagner front, Own rear.	
W—Westinghouse.	
KEY TO DEFINITIONS, ABBREVIATIONS AND REFERENCES	
DEFINITIONS	KEY TO REFERENCES
MAKE AND MODEL	c.f.—Cab Forward design.
OPTIONAL UNITS	c.o.e.—Cab-Over-Engine design.
For the express purpose of best fitting the truck to the individual job most of the models listed can be provided with optional engines, transmissions, axles, etc., and these models when so equipped are considered standard stock models.	(C)—Converted Ford or Chevrolet model.
CHASSIS LIST PRICE	ei, identifiable by engine make listed.
The chassis list price applies to the minimum standard wheelbase with standard tires and standard equipment. All prices are F.O.B. factory. Chassis list price includes the price of the Cab unless otherwise noted.	(D)—For dump or tractor service only.
RECOMMENDED GROSS WEIGHT FOR NORMAL SERVICE	(D)—Diesel-engine equipped.
The Gross Weights published herein are those supplied by manufacturers as their Recommended Gross Vehicle Weights for Normal Operating Conditions, and are based upon the Maximum Authorized Tire Size listed. In actual use, the gross weight may increase or decrease the gross vehicle weight rating when either favorable or unfavorable operating conditions are involved. Since the proper performance of a motor truck depends upon many factors, including load, road conditions, etc., the gross weights that a manufacturer is prepared to recommend will vary with particular conditions, and the manufacturer's own standard of safety factors. Specific recommendations, therefore, are given for each model from the manufacturer's representative.	e.b.s.—Engine-between-seat design.
	e.u.s.—Engine-under-seat design.
	(N)—Not available as a tractor.
	(T)—Designed for tractor use only.
	(3) Available—All models available in c.o.e. design, oversize power plants, oil engines and six-wheel construction.
	(5) Concord—These models available with double drop bus frames.
	(6) Federal—245 cu. in. engine and 11" clutch available on Models 16 and 76.
	283 cu. in. engine available on Models 16, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.
	55, 92 and 94, 428 cu. in. and 501 cu. in. engines available on Models 45, 517 cu. in. oversize or two-speed rear axles available on Models 45, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563,

[illegible]

Includes special panel body. † Denotes new models or change in specifications.

* Prices not available at this time.

x Delivered at factory price. includes all Federal taxes but does not include any State and/or local taxes.

Diamond T—Two-speed styles optional at extra cost

30-32 v 8 + Rec- 7 00/10-8 nly 8

+ 0.03 - 0.50 /

Line Number	MAKE AND MODEL	TIRE SIZES		WHEEL-BASE	ENGINE DETAILS			TRANSMISSION		REAR AXLE		FRONT AXLE		BRAKES			C-A Dimension (Min. Std. W.B.)	FRAME								
		Dual rear S-sing rear	Standard Front and Rear		No. of Cylinders, Bore and Stroke	Displacement	Comp. Ratio	Torque lb. ft.	H.P. at R.P.M.	Main Bearings Number, Diameter and Length	Governor Standard	Make and Model	Forward Sp'ds	Make and Model	Clear and Type	Drive & Torque			Gear Ratio	Range in High	Make Location	Type	Hand Location			
																								Chassis List Price	Minimum Standard	Maximum Standard
595	Federal 8	6.00/16S	7.50/17S	Her QXB3F	6-3 1/4 x 4 1/4	205	9.6	144	66-3500	7-2 3/4 x 10 1/2	N	WG-T9	4	4	5121H	DS	H	4.14-6.66	96	2950H	BH1	LAIH	210	308	8	34
745	135	6.00/20S	7.50/20	Her JXFF	6-3 1/4 x 4 1/4	232	6.7	164	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
17	870	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
18	870	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
19	135	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
20	135	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
21	135	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
22	135	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
23	135	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
24	135	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
25	135	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
26	135	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
27	135	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
28	135	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66	114	299	478	LAIH	299	478	8	34
29	135	6.00/20D	8.25/20	Her JXGF	6-3 1/4 x 4 1/4	242	6.7	174	75-3000	7-2 3/4 x 10 1/2	N	WG T9	4	4	53547H	SE	SE	5.14-6.66</								

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[illegible]

Prices subject to change without notice.

er) Tire casualty governs gross load

is Bales not available at this time

models or change in model coefficients.

A Denoted

† Rear 11.25/24. †† Rear 12.00/24. ‡ Rear 12.75/24. ‡‡ Rear 13.50/24. × Front 7.00/20. † Denotes new models or change in specifications.
 ◆ International—6-cylinder Diesel engine Model AA-600 available in these chassis. Diesel Model HB-600 also available in DRD-348-T.
 ** Prices not available at this time.

We'd like to say "YES!"

When a friend needs your help—needs it urgently—you like to say "YES!"

But sometimes, for unavoidable reasons, you are forced to say "NO!"

How you hate to say it!

That's the way we feel today.

Here we are, turning out millions of tons of steel—more than ever before in Republic's history.

Yet, to many of our friends—our customers who have learned to depend upon us for steel—we may have to say "NO" when we'd like to say "YES."

The reason is well known. World affairs demand that we build for defense—defense

for your business, your possessions, your home, your family. And modern equipment for defense requires steel—quickly and in unprecedented quantities.

Republic must—*AND WILL*—supply first the steel needed for defense purposes.

At the same time, we want to be fair to *ALL* our other customers in apportioning steel available for non-defense use.

If we have said "NO" to you — or if we must in the future — just remember that we don't want to say it — we'd like to say "YES."

And remember, too, that the steel you can't get is the steel that is being used to protect all of us against an uncertain future.

REPUBLIC STEEL CORPORATION

General Offices: Cleveland, Ohio

Berger Manufacturing Division
Culvert Division
Niles Steel Products Division



Steel and Tubes Division
Union Drawn Steel Division
Truscon Steel Company

ALLOY and CARBON STEELS • STAINLESS STEEL • PLATES
BARS and SHAPES • STRIP • SHEETS • PIPE and TUBING

TIN PLATE • NUTS • BOLTS • RIVETS • NAILS • PIG IRON
FARM FENCE • WIRE • FABRICATED STEEL PRODUCTS

TANK WITH SWANK

(CONTINUED FROM PAGE 33)

anatomy was from some chocolate ice cream she was eating. See how many shops you can name that a child can play in and remain clean.

As if that were not enough, Thompson took us out to the shop again and we looked at trucks, under trucks, lifted the hoods on trucks and it all matched up. No dirt! We asked

TRUCK NO.	Battery	Plugs	Brake	Transmission	Overhaul Job	Carburetor	Tires	
							L. F.	R. F.
	Starter	Generator	Fuel Pump	Carbon & Valve	Rear End	Emer. Brake	L. R.	R. R.

This record card indicates work done and on what parts during check-ups

Thompson how much it cost to keep a fleet and fleet shop looking like that. He looked at us as if we were nuts and said that it did not cost anything. It seems that Palmer and Thompson feel that you cannot work in dirt and there is no reason why you should try. If anything is wrong on a truck they maintain that you cannot find it if it is buried under a lot of muck. They have come to look upon their cleanliness as an integral part of their maintenance program and perhaps a saving.

That left us with only one question to get at the bottom of any operation so exceptional in its conception of cleanliness: "How do you go about keeping things so clean?"

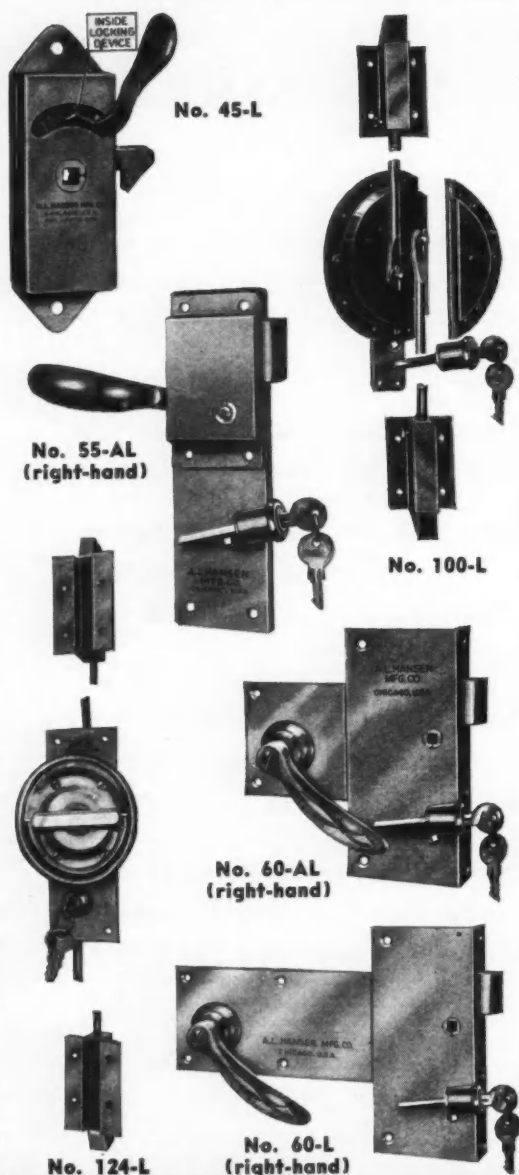
There are not many rules about it but we know a lot of people who work in fleet shops that would not get along at Palmer's. If Thompson were to tell them to clean up something they would not understand what he meant, at least not in the degree that he meant it.

Most of the Palmer trucks haul milk from creameries scattered from Wyalusing, Pa.; Seeley Creek, N. Y., and Pottstown, Pa., to Philadelphia and Hoboken. The runs break at the shop so that most of the trucks get into the shop every day. The van trucks haul milk products over about the same territory. A few of the tank trucks are engaged in hauling gasoline from Marcus Hook, Pa., to such points as Bloomsburg, Stroudsburg and Lancaster, Pa. At worst the gasoline trucks get into the shop every third day and usually more frequently than that.

Every time a truck comes into the shop it is inspected and washed. The inspection includes wiping down the engine. If the engine seems beyond the wiping stage, it is sprayed with cleaner but it never gets by the inspection without an effective cleaning.

(TURN TO PAGE 60, PLEASE)

DEFENSE!



Against—

- Breakdowns
- Delays
- Upkeep Costs
- Replacements

WHETHER in defense production, defense service or defense against breakdowns—delays—upkeep costs—or replacements—HANSEN Hardware can be depended upon to "deliver".

Built especially for heavy-duty and severe commercial body service, easy and economical to install—seldom requiring attention or replacements—Hansen Hardware stands back of both builder and user.

New products shown in the new Hansen Catalog defend you against using any but the latest designs.

PRODUCTS ILLUSTRATED

No. 45-L Sliding Door Lock, with Locking Device. Locks in open and closed position.

No. 55-AL Cab Lock (right-hand), with Locking Cylinder and two keys. Built-in pull handle.

No. 100-L Rotary - and - Take - up Lock, with Locking Cylinder. Makes doors wedge-tight.

No. 124-L Slam-and-Take-up Lock with Locking Cylinder and two keys. Tamper-proof.

No. 60-6L (right-hand), fitted with Locking Cylinder and two keys. Locks securely.

No. 60-L (right-hand), with Locking Cylinder and two keys. One-piece construction.

Send for
NEW Catalog

A. L. HANSEN MFG. CO.
5047 Ravenswood Avenue CHICAGO, ILL

More Power to the Marines



This photograph shows an FWD truck modified to meet the requirements of the Marine Corps and is one of a fleet of trucks being manufactured for the Marine Corps by the Four Wheel Drive Auto Co. of Clintonville, Wisconsin.

There's a WAUKESHA ENGINE under the hood

Trucks! Trucks! Trucks! Indispensable to the armed forces; vital to the defense industries. Weapons, men, and materials must move! And the engines that power the trucks that move them must be built. And Waukesha is building them—for these FWD trucks and for others.

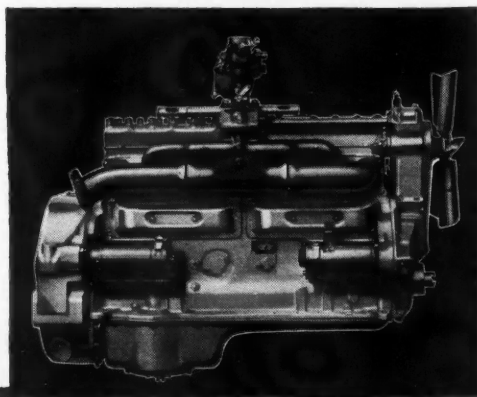
Waukesha built truck engines in 1917-18 . . . and has been building them in every one of the twenty-odd years since the First World

War. And Waukesha is building truck engines for the present emergency.

All this time Waukesha has been building them better and better every year—so that today *and tomorrow* Waukesha-powered trucks will be able to meet the heavier demands for transportation and defense service.

Waukesha Gasoline and Oil Engines for Automotive and Stationary Power range in size from 5 hp. to over 300 hp. Write for Bulletin 1079.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS., NEW YORK, TULSA, LOS ANGELES



**MORE
POWER**

**FOR
DEFENSE**

WAUKESHA ENGINES

(CONTINUED FROM PAGE 58)

The washing is done at a washrack just inside the door with a power washer. A little soap is used occasionally on the chassis but none is used on the bodies. At the time the trucks are washed, the cabs are cleaned. Inspection of the interior of a cab on a 700,000-mile truck showed that it looked like one on a show-room floor.

Despite all of this washing the trucks are painted only once every two to three years, although Thomp-

son says that if the state of Pennsylvania continues using more tar on roads, he will have to use more paint. Most of the tanks are aluminum and do not get painted at all. The paint shop is just inside the other door of the garage located similarly to the wash rack. It has a permanent ceiling and exhaust fan. The edge of the ceiling is equipped with hooks and when a vehicle is being sprayed, canvas drop-sides, which reach the floor, are hung. When the painter is not busy painting a truck he is usually

touching up a bad spot or painting rims, etc. There are no paint daubs around to betray the paint shop and it is doubtful if you would ever notice it when the curtains have been removed.

Because of the frequent washing, the trucks are lubricated at around 600-mile intervals. It is done with portable equipment anywhere in the garage that might be handy. Lubricant is dumped from the transmission and differential every 50,000 miles and replaced. Oil is changed every 5000 miles and filter cartridges are changed when the oil darkens. The fleet recently discontinued the services of an outside crankcase draining analysis because the reports seemed to corroborate what the mechanical force already knew. They felt that they did not need corroboration at the price. After thinking it over they re-instituted the service before there was any interruption.

A mechanic, of which there are two, keeps a card record of work done on the trucks. Thompson used to keep the cards up to date but has now handed the detail over to the mechanic. These records show that Palmer changes the spark plugs, distributor points and fuel pumps every 10,000 miles, although Thompson is now saving the removed plugs in case of a shortage later. When questioned about this practice of frequent replacement Thompson said that the cost is relatively little and since there is no far-flung service organization, the cost of a road failure is high and the cargo perishable, so it does not pay to take a chance.

The tractors are big and heavy and they have plenty of engine. While they draw 2800 gal. of milk or 4300 gal. of gasoline, mostly in mountain country, they seem to stand the strain well. New engines last about 100,000 miles before they are opened up for any reason at all and then usually for a valve grinding job. About 150,000 miles is expected from an engine before any cylinder reconditioning is done. While shortage of power and oil consumption are sometimes the deciding factor in overhauling, more frequently it is because the gasket between the block and crankcase has given out and is leaking oil so badly that it has to be replaced. When the engine is taken down to do the job,

(TURN TO PAGE 62, PLEASE)

HOW MUCH OF THE DAY IS EACH TRUCK

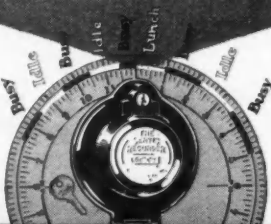
Actually Running?



**Most Trucks
SEEM Pretty Busy, But
Actually They Do More Standing Than Running**

★ That's important news, but you don't really get it until you "see the picture" of your trucks—like this one, for instance. • This picture was made from daily charts from Servis Recorders. Wouldn't it startle you to find out that one of your 5 trucks, for instance, was running 3 hours less per day than another truck! • It's an interesting story; we can't tell it all here, so write for our SKY-LINE Chart, and also our free booklet—"Ten Ways Of Getting More Work Out Of Motor Trucks."

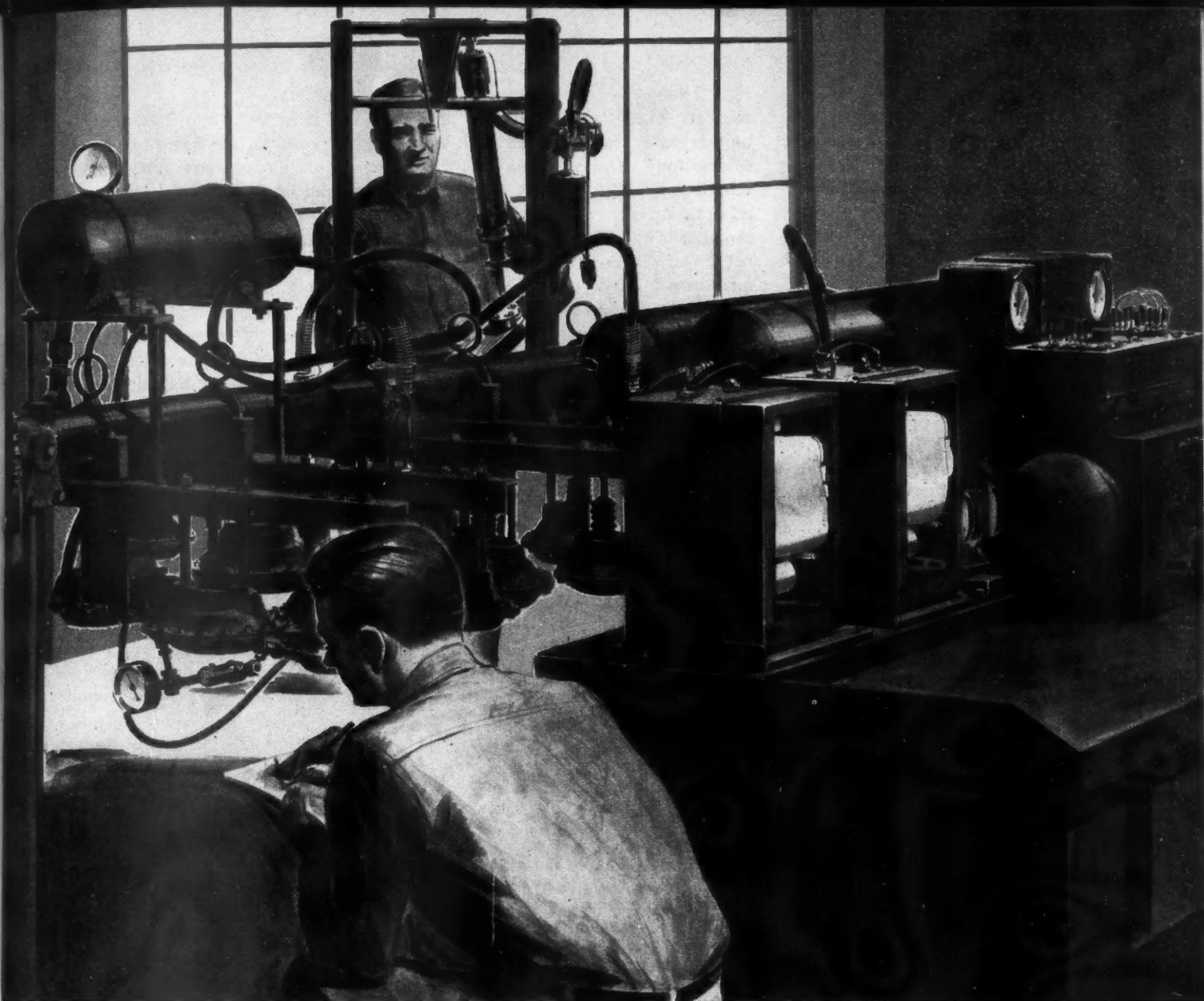
You'll Never **KNOW**
Until You Install
Servis Recorders



THE SERVICE RECORDER CO.
1375 Euclid Avenue
Cleveland, Ohio

The Servis Recorder

Tells Every Move Your Truck Makes



HERE'S A VEHICLE YOU NEVER SAW ON THE HIGHWAY

Capable of simulating any specific unit or group of units, Bendix-Westinghouse research engineers, by virtue of this unique device can, at almost a moment's notice, reproduce and make an exhaustive laboratory study of the most perplexing control problem that should develop ★ Although the actual object of investigation may be thousands of miles away, this service, in conjunction with competent field representation, brings the factory laboratory to your very seat of operation . . . and promptly ★ Here again is an

instance typical of Bendix-Westinghouse thoroughness . . . a service which fortifies the traditional dependability of genuine Bendix-Westinghouse Air Brakes and Air Control Devices ★ If you haven't already investigated the many exclusive advantages genuine Bendix-Westinghouse Air Control holds for you, we invite you to contact the nearest Authorized Distributor or, address the Bendix-Westinghouse Company directly. . . . In either case we'll be happy to serve you and without obligation, of course.

BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE CO.
ELYRIA, OHIO



AN ORGANIZATION WHOSE UNDIVIDED EFFORT AND COMPLETE RESOURCES

ARE DEVOTED TO YOUR CONVENIENCE AND SAFETY

(CONTINUED FROM PAGE 60)

the labor is great enough to make it advisable to go ahead and overhaul the engine so it will not have to come down again in the near future.

Oil consumption has never been a very acute problem around this fleet. Thompson says that in the nine years he has been around he has bought piston rings only as part of a complete overhaul. When overhaul time comes there is not much testing of accessories. They are simply exchanged for rebuilt ones with outside

sources. Then Palmer feels that the unit is ready for the road with no reservations. The oil going into the rebuilt engine, as in every engine at oil draining time, is doped in the fleet shop with an inhibitor. Sludge is never encountered in troublesome quantities.

Recently Thompson has been going over the prices of some of the outside accessory rebuilding and he isn't too keen over them. He is experimenting with a little rebuilding of several of them himself and it would not be sur-

prising if he went into it thoroughly and completely. He likes to change generators and starters every 50,000 miles and on the present basis it is a little expensive.

No tire work is done in the fleet shop. Seldom is there any to be done, since the milk trucks do not carry spares and consequently cannot bring in any flats. At intervals along the routes traversed by the milk trucks spares are stored in 24-hour shops that have good service trucks, and when a tire goes flat the driver calls the nearest shop. The gasoline trucks have not settled down to steady enough routes to make this possible and as a result have to carry spares.

The repair shop is not very impressive because there is never more than one engine down at a time. It consists of work benches and some equipment strung along two walls from a back corner of the garage. Inspection work is performed all around the garage. Four men, of varying stages of skill, do all of the things that the two mechanics do not do, such as wash trucks, move them and help around the place generally.

In the orderly stockroom is some \$3,000 to \$4,000 worth of parts and supplies. There are some \$300 worth of batteries and \$200 in paint. These items, it occurs to Thompson, may become a little hard to get later on so he has stocked up. At present he is attempting to determine what other items it would be wise to own in a little greater quantities than his present needs indicate.

END

(Please resume your reading on p. 34)



This gigantic 50-ton Mack super-dumper, purported to be the world's largest, and scheduled for dumping duty on the Panama Canal third locks system, takes along greetings from chorines from the show hit, "Panama Hattie." Sixty-nine of these monster dumpers, costing more than \$1,000,000 will move more than 35 million cu.yd. of Panama Canal dirt



★

SCIENTISTS REVEAL
MILLION & A HALF SPRINGS
IN
SENSATIONAL
HAIRFLEX CUSHION!

ARMOUR'S chemical engineers recently revealed that there were 1,420,000 individual curled hair springs in 1 standard HAIRFLEX truck seat pad approximately 53" x 23" x 1".

Springs mean comfort. More springs—more comfort. That's why you'll find a new comfort ride in this HAIRFLEX pad. The 1½ million curled hair springs are bonded each to the other by buoyant latex rubber to make a thick non-shifting, non-lumping seat pad.

3 Reasons Why Hairflex Belongs in Your Fleet

- Safety** . . . Drivers concentrate on traffic . . . no seat worries.
- Comfort** . . . Contour-fitting HAIRFLEX relaxes drivers . . . reduces fatigue.
- Economy** . . . Less truck idle time for seat repair . . . more earning hours.

A MILLION drivers of fleet trucks and passenger cars feel the thrill of a comfort ride on Armour's HAIRFLEX every day. Feel for yourself how a million and a half curled hairs over a spring unit make your truck driving a new pleasure. Specify Armour's HAIRFLEX in your next order.

When You Buy
Specify **ARMOUR'S
HAIRFLEX**

**ARMOUR AND COMPANY
CURLED HAIR DIVISION**
1355 W. 31st STREET CHICAGO, ILLINOIS

**HEY! THE JOB'S ONLY
HALF DONE**



**and a HALF DONE overhaul
won't stop Oil Pumping . .
ALWAYS CHECK ENGINE BEARINGS!**

Whether the engine is torn down for routine overhaul or to correct oil pumping, the job is only **HALF DONE** if the bearings are not checked, and replaced if worn.

New rings are not enough for oil control. When motor-fouling oil waste starts at worn bearings, correction must start there, too. Even the best of new rings and spark plugs are soon fouled when oil throw-off at the bearings is excessive, and power-stealing oil waste continues.

Make it standard practice, when the engine is opened up, to check the bearings. If worn, replace *in sets* with Federal-Mogul Oil-Control Bearings for maximum performance, mileage and economy.

Any shop man interested in knowing more about how bearings are a vital factor in modern engine performance can obtain a copy of the "Engine Bearing Service Manual" **FREE** by writing us direct.

FEDERAL-MOGUL CORPORATION
4805 JOHN R ST. • DETROIT, MICH.

Don't Guess at the Cause of OIL PUMPING

Only the Federal-Mogul Oil Leak Detector provides accurate, *maintained* pressure essential for accurate checking of ALL bearings and oil lines before opening up the engine. This diagnosis of engine troubles saves time, labor. It also provides an ideal check-up after every overhaul. Portable, easy for any mechanic to use, low-priced. Send for details.



**FEDERAL
Mogul**

THE COMPLETE ENGINE BEARING SERVICE LINE

FEDERAL-MOGUL CORPORATION
4805 John R St., Detroit, Mich.

Send me complete information and price on the Bearing Oil Leak Detector.

Name

Address

City State

NEWSCAST

(CONTINUED FROM PAGE 46)

meeting is slated for Nov. 5 and 6 at the Fairmont Hotel, San Francisco. The national transportation and maintenance meeting will be held Nov. 13 and 14 in Hotel Statler, Cleveland.

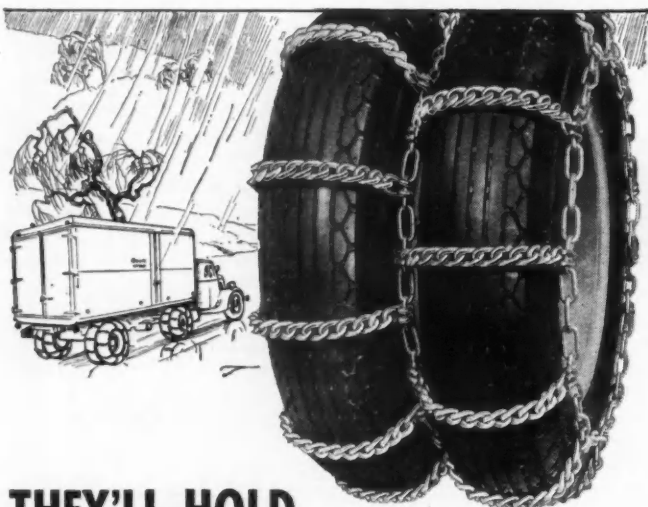
On the West Coast, J. Verne Savage will speak on "Motor Vehicle Inspection"; Peter Glade on "Supercharging Highway Transport" and E. W. Templin on "Chromium Plating." Other papers will include

"Substitute Materials," "Interstate Transportation and Maintenance" and "Modern Crankcase Oil."

At Cleveland F. K. Glynn will speak on "Enhancing the Intensity of Usage of Motor Vehicles"; Errol Gay on "Engine Deposits—Their Prevention and Removal"; and Louis Morony "State Restrictions on Motor Vehicles and Their Effect on Defense Transportation." Maj.-Gen. Edmund B. Gregory, the quartermaster general of the U. S. Army, and Commissioner John L. Rogers, chairman of the Central Motor Transportation Committee, will be featured speakers.



This V8 engine ran up a total of 225,000 miles before it was brought in for an exchange. Rings had been replaced at 87,000 and 153,000 miles. Cylinder walls wore less than .007 and the crankshaft less than .002. Al Notzon, S. N. Johnson Co. (owners), and the Sames Motor Co. service manager, Laredo, Tex. (right), talk it over with the engine between them



**CLAW
GRIP**

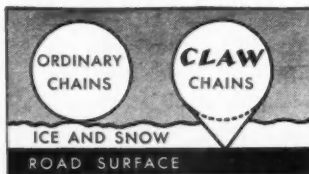
THEY'LL HOLD the ROAD with **CLAW** TRUCK CHAINS

Only **CLAW** chains have the knife-edge that cuts into ice and snow for positive traction and maximum skid control.

Regardless of road conditions...ice, snow or mud...trucks equipped with heavy duty **CLAW** Truck Chains hold the road and get through on schedule.

CLAW Truck Chains are built for all-weather performance. First, there's the patented **CLAW**ing edge that actually bites into snow and ice...provides positive, non-slipping traction. Then, there's 20% more metal in every cross link (see diagram at right) adding extra wear and mileage. And because every **CLAW** link is built of **CLAW**-Alloy steel, the toughest chain metal known, **CLAW** Truck Chains can take the terrific abuse of heavy duty trucking and give maximum safety and mileage at low chain cost.

CLAWS are easy to put on too. The improved Blue Boy fastener snaps on in a jiffy. Special Indented Rim Chains eliminate play and excessive breakage between cross and rim chains. Your trucks will hold the road and get through if you use **CLAW** Truck Chains. Write for illustrated literature.



20% MORE CLAW-ALLOY STEEL IN THESE KNIFE EDGES... Unlike ordinary round links, **CLAW** links have a protruding "V" of steel that bites deep into ice and snow. There's actually 20% more metal in every **CLAW** cross link for safer, longer mileage. They can't slip because they **CLAW**.

COLUMBUS-MCKINNON Chain CORPORATION

General Offices: TONAWANDA, N. Y.

PLANTS AT ST. CATHARINES, ONT., CAN. AND VEREENING, SO. AFRICA



Truckers Win Safety Contests

The Texas Motor Transportation Asso. has been named winner in the Association Division of the Seventh National Truck Safety Contest. The trophy was awarded by the American Trucking Associations, sponsors of the contest.

Consolidated Freightways, Inc., of Portland, Ore., was proclaimed winner of the Trailmobile Trophy awarded to the trucking firm selected for outstanding progress in safety methods and service to other users of the highways. Horton Motor Lines, Inc., of Charlotte, N. C., placed second, while the Hale-Halsell Company of McAlester, Okla., finished third.

Fram Gets Citation

The Fram Corp., East Providence, R. I., recently received a special citation for industrial research, in the field of oil and motor cleaners by the Engineering Societies of New England.

Dodge Has New Line

Details will be given in key cities early in October on a "powerful" and complete line of new Dodge trucks designed to meet defense needs.

Fair Weather for Pyrene

All's fair with Pyrene's weather forecasts which will be continued for another year—with refinements. Last year the company issued monthly advance reports predicting every important snowfall throughout the country. This winter reports will cover smaller areas; be more numerous. Flash warnings will be teletyped to strategic points from which postcard warnings will be sent out.

(TURN TO PAGE 90, PLEASE)

THESE SETS ARE *really Engineered*



SEALED POWER *Individually Engineered* PISTON RING SETS

GANGWAY FOR GLENDENNING

(CONTINUED FROM PAGE 25)

perimental operation of two units for some time before the purchase of 18 additional units last year. Six more units were placed in service last July, bringing the total to 26. Delivery of another six was expected at this time of writing.

The company's EO routine (experimental operation) illustrated in

its diesel experience, is applied to operation of all its equipment. Thus new units and new devices are given practical tests on a small scale. This was done with mechanical refrigeration units before the present equipment was placed in operation. These units are powered by small gas-operated motors which are oiled and lubricated every thousand miles and checked after every round trip. The methyl chloride type of refrigeration equipment used is fully automatic and has given little or no trouble.

The appearance of Glendenning equipment has been an important part of the maintenance program. Bodies are painted a uniform red offset with gold trim. No unit is allowed on the highway that is not clean, bright and sparkling in appearance. Trailers are cleaned on the inside with a power machine operating at a 300-lb. water pressure. Soaps are used when necessary. Exteriors and cabs are cleaned with water and a soft hand brush, no soap. No polish is used and body finished with an overcoat of varnish.

One of the most interesting of the Glendenning units is the horse-drawn vehicle. It operates within a mile of the terminal and is distinctive, from a publicity point of view, because it is the only horse-drawn delivery service in this modern industrial area. The vehicle has pneumatic tires and hydraulic brakes. The body is red and the wheels and firm name are in gold. Motive power is supplied by "Pilot," a 2100-lb. Belgian horse trained to start, stop and turn at a word from his driver. Mechanical maintenance for this unit is, of course, negligible, though the fuel bill for oats and hay consumed by Pilot runs to a considerable sum annually. The horse has been in service with the firm for seven years.

Also providing a useful function as a publicity medium is a one-fifth size "baby trailer" built in the Glendenning shops. A miniature replica of regular size trailers, the "baby" has a refrigerated body so that foods and drinks may be carried. This unit is loaned out for picnics and other purposes for its advertising value.

END

(Please resume your reading on p. 26)

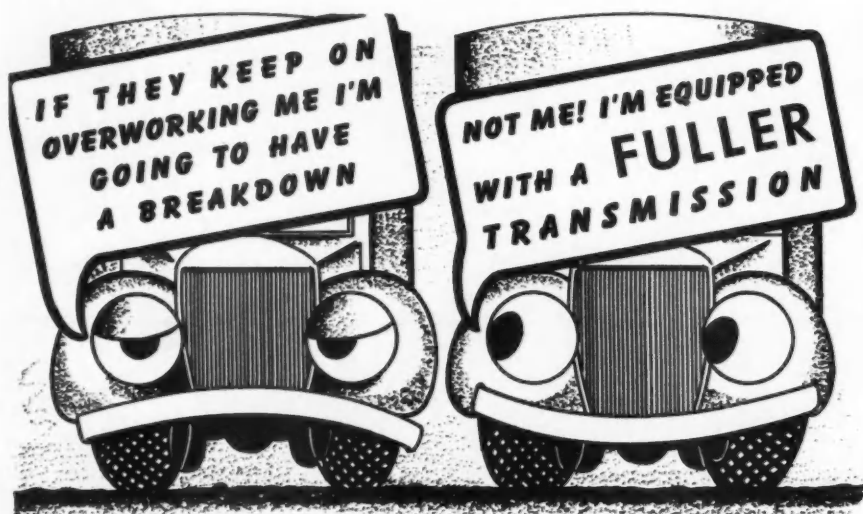
Army Standardizes Its Gas and Oil

In a move to simplify the problem of supplying oil and gasoline to Army vehicles in the field, the War Department has announced that one standard type of gasoline will replace the four varieties formerly in use. The Army's standard gasoline is a high test, 80 octane fuel like high-test commercial gasolines.

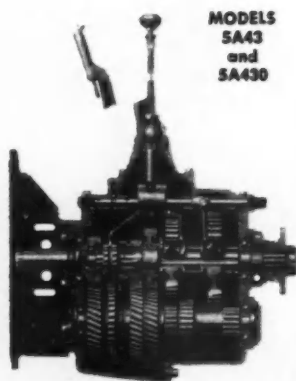
Fuels (oils) for Diesel-powered vehicles will now be of three varieties instead of the former four, and lubricating oil for Diesel vehicles has been similarly standardized.

Lubricating or crankcase oils for gasoline vehicles is cut from 10 types to three.

While no mechanical changes will be necessary in motor vehicles now in use, it is anticipated that the use of one standard gasoline may influence the design of future models.



For More Hauls...Less Overhauls SPECIFY FULLER'S



FULLER Transmissions today are helping many fleet operators to complete more hauls faster, with fewer break-downs and greater safety. For FULLER's are expertly engineered to provide the ratios required for maximum road speed under all conditions, with minimum strain on the engine. FULLER's likewise shift more easily and operate more quietly — qualities that make a hit with the men who do the driving. Specify FULLER Transmissions. They'll help you haul more payload per dollar!

FULLER MFG. CO. Kalamazoo, Mich.

Enough for Us!"



SERVICE FOR YOUR FLEET!

1 YOUR PROBLEM IS ANSWERED! Nothing is taken for granted, no step is overlooked. Socony-Vacuum's fleet engineer analyzes your fleet by makes and models, for type of service, loads carried, operating temperatures, engine condition, maintenance methods. He then helps your men carry out money-saving operating and maintenance improvements.

2 LUBRICANTS TO FIT! Socony-Vacuum's engineers are not guided by guesswork. They base recommendations on scientific tests—select products for your equipment from Delvac "500 Series" Oils, Sovac Truck-Bus Oils, Mobilubes, and Mobilgreases.

3 75 YEARS' EXPERIENCE! And every Socony-Vacuum fleet engineer has been trained to apply this experience—greatest in the oil business—to help you hold maintenance and operating costs to a minimum.

4 NATION-WIDE SERVICE! Across the U. S. A., you will find our fleet engineers available to recommend lubricants to meet *all* conditions on your routes. SOCONY-VACUUM OIL CO., INC., and Affiliates: Magnolia Petroleum Co., General Petroleum Corporation of California.

Address Truck-Bus Division
Socony-Vacuum Oil Co., Inc.
26 Broadway, New York City



Fleet Engineer

TRUCK ABUSES

(CONTINUED FROM PAGE 30)

clearer understanding of our goal. Here is an edited version of the second presentation and the questionnaire based upon it:"

Gentlemen:

You men play such a tremendously important part in keeping our truck maintenance costs at a minimum that it is gratifying to see worthwhile results coming from these educational talks. We note that the spirit of practically all of you indicates that you are not satisfied with being called good drivers, but that you want to be

called expert drivers. You are professionals; you have chosen truck driving as your means of earning a livelihood for yourselves and your families. Collectively speaking, you have qualified to drive expensive automotive equipment on crowded and sometimes dangerous highways. Therefore, it is only fair for us to expect and demand the keenest of good judgment and intelligence on the part of those who are, while on the highway, in charge of expensive equipment, and solely responsible for the economical and the safe driving practices which are important to this company.

Of course, we realize that truck neglect and abuse are not entirely confined to drivers; sometimes the responsibility can be

placed at the doorstep of other people, such as the mechanical force, the designers, etc. It is our desire here, however, to dwell solely upon practical everyday examples of what drivers should or should not do in the interest of efficient economical operation. Because careless and abusive treatment still exists, and vehicle maintenance is still expensive, every possible means must be taken to keep costs to a minimum. Expert driving will help keep costs down, and help eliminate breakdowns which always have an adverse effect on our customer relations.

So, without further delay, let us review some new illustrations of the cause and effect of driver abuse of vehicles:

1. Cracked Cab Door Glass

Sometimes there are mechanical reasons for this kind of trouble. On the other hand, much glass breakage can be attributed to neglect, rough usage, faulty handling, etc. Try to remember that costs for such breakage add up to hundreds and even thousands of dollars yearly for replacements. Be more considerate in this respect!

2. Frozen Radiator

In this case considerable water was added without checking the strength of the anti-freeze, and later in the day the temperature dropped to zero. The answer is obvious, and also the expense! This must be classed as gross negligence. Safeguard yourself and the company by living up to your responsibilities for which you are being paid as well as for driving.

3. Overheated Radiator

One extreme is nearly as bad as the other except that in this case the core was salvaged and was used again after repairs were made. Too much alcohol is the brother of not enough.

4. Cracked Cylinder Head

Using the old "bean" is something that we are all paid for. In this case, it is evident that there were no tenants upstairs. The evidence and the admission proved this. The engine developed a water leak at the lower pump hose connection, ran low on water and started to steam. The driver stopped at the next station to replenish the water. Being a little late, as usual, this driver waited five minutes instead of 15 or 20 minutes, and then filled up with nice cold water—the kind we like to drink! Well, the results are obvious. He got about 10 miles from the plant when a bad skip developed, so bad that his engine started bucking and the driver had to give up and phone in. Reasons? Take a good look at the picture!

5A. Damaged Radiator Shutter

There are many causes for damaged shutters. Let us take up a few specific cases. In this one it was a squeeze play between our truck and the truck ahead. Our driver did not allow enough distances between himself and the vehicle he was

(TURN TO PAGE 72, PLEASE)

**THIS SOLDER DOES
BETTER WORK WITH
LESS GRIEF!**



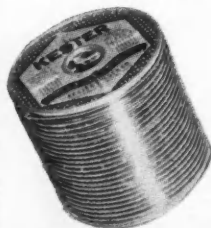
Shop Costs Cut With KESTER Cored Solders

Give your mechanics the right materials with which to work, and fleet maintenance costs will come down! Kester Cored Solders illustrate the point exactly.

Kester Acid-Core Solder, for all general repair work, is highest quality—therefore, it resists bending, shock, vibration, contraction, expansion. It makes permanent repairs. That means your equipment won't come back to the shop again and again for the same old trouble.

Kester Acid-Core Solder is easier to use—cuts actual shop-time, gets positive results—because the chemically pure flux is sealed right in the solder itself. Hit-and-miss methods are eliminated entirely.

Standardize on Kester Cored Solder for every soldering repair. Order them from your wholesaler.



KESTER SOLDER COMPANY

4205 Wrightwood Avenue Chicago, Illinois

Eastern Branch: Newark, N. J.
Canadian Branch: Brantford, Ont.

KESTER CORED SOLDERS
FOR EVERY AUTOMOTIVE USE

TOUGH...but oh so gentle

TOUGH on Oil-Pumping . . . GENTLE on Cylinder Walls

● If you're "from Missouri" about piston rings, let this letter from a Missouri fleet operator* "show you" what Hastings Steel-Vent Piston Rings are doing.

"We installed Steel-Vents in a B. G. Mack at 68,364 miles and they are still performing satisfactorily at 110,055 miles.

"Another set went in an E. H. Mack at 82,078 miles and now at 130,096 miles it is still delivering satisfactory service.

*Name on Request.

"A D-40 International got a new set of Steel-Vents at 48,550 miles and the rings are still going strong at 77,485 miles. We believe these examples will show you what excellent experience we are having with your rings."

Next time you have to replace a set of worn rings, put in a set of Hastings Steel-Vent Piston Rings and see for yourself how they stop oil-pumping and check cylinder wear.

HASTINGS MANUFACTURING COMPANY, HASTINGS, MICHIGAN
Hastings Mfg. of Canada, Ltd., Toronto



HASTINGS

STEEL-VENT PISTON RINGS

Stop Oil-Pumping • Check Cylinder Wear

(CONTINUED FROM PAGE 70)

following. The other driver had reason to stop short. The distance and our driver's timing were both bad. You can see the result.

5B. Damaged Radiator Core

Another case of poor judgment! This time the tail gate of the truck ahead acted as its bumper. The core damage resulted because of the crash against the radiator shutter.

In tough going give the other fellow plenty of room. Use sound timing on brake applications.

6A. & B. Damaged Fan and Core

Notice that engine fan! Looks like a sick rabbit with three eyes if you look at it closely enough. You can see what the rabbit got sick on—not too much spinach, but too much radiator core. A rabbit has good ears, but so has a human being! Why therefore didn't this driver hear the fan eating up the radiator core?

After careful questioning, the driver admitted that he heard a scratching sound or rattle, but gave it no particular thought. We know it was not the driver's fault that the fan came loose, but had he stopped when he heard an unusual sound under the engine hood, he would have saved the

company a lot of money. A simple repair is certainly a lot cheaper than the replacement of a whole radiator core and fan.

7. Cracked Bell Housing

As a reminder from our first talk, this condition appears again. If you get stuck in a soft fill, or are halted by a hole, culvert or excavation and cannot extricate yourself after a fair and easy trial, *call for help*. Use only authorized Tide Water emergency contacts. Never use a company vehicle for towing purposes.

8. Broken Steering Spindle

Steering spindles, like so many other parts, will only stand a certain amount of severe strain and abuse. This one stood more than its share, but still hung together until bedded down for the night. It was simply luck that an inspection was due on this particular truck the day this happened. Otherwise tomorrow's result might have been disastrous not only to the vehicle but also to life and limb.

The break occurred when this truck, in avoiding another car struck a culvert, but came through all right (as the driver thought). Instead of stopping to check his truck, he kept going, feeling that he had done a swell job. He did, to a certain extent, but had he stopped and taken a good look at his front end he would have seen his right wheel dished, and would immediately have known that something was out of line. As it was, the break or fracture did not throw his steering out badly enough to materially affect the steering ability of the truck, but it is fortunate that he got in without causing further damage to his own vehicle or to others.

9A. Bent Wheel

A short story in three parts is about to be unfolded. Look carefully at the damaged wheel (picture 9A).

This driver is really a pretty good man. He is kind to his family and he never kicks babies, but he certainly drove a *hard bargain* with his truck. He unintentionally slammed a rear wheel diagonally up over a curb in order to spot his truck in the best position for making his regular drop. After the day was done he returned his truck to its home base as usual, but reported nothing—not even the bad dents and distortion of the wheel. Not being reported, this truck was not looked over by the mechanic because it was not on the schedule for that particular day.

9B. Broken Brake Shoes

Three days later, this same driver did report that the brakes were not holding well. An inspection revealed the brake shoes bent and distorted. Also, as soon as the wheel was off the drum, it collapsed as you can see in picture No. 9C.

It was just plain good luck that this wheel did not lock and cause a serious accident while on the road. Had the condition been reported at the proper time all this trouble would have been avoided.

(TURN TO PAGE 74, PLEASE)

PERFECT ALIGNMENT!



LINK-BELT

SHAFFER

ROLLER BEARINGS

FOR FRONT WHEELS, DIFFERENTIALS AND REAR AXLES



THE extent to which a bearing can maintain perfect alignment is an important factor in its ability to resist wear and to give smooth, free-rolling performance. The exclusive concave-convex design of Link-Belt Roller Bearings provides *constant* perfect alignment which is your positive guarantee of better service. Get the facts about these bearings and why their design is so superior to ordinary bearings. Your Jobber knows—ask him today!

LINK-BELT COMPANY

519 N. Holmes Ave., Indianapolis, Ind. * Warehouses in all principal trading centers
Made by the makers of the famous Silverstreak Silent Timing Chain!



PERFECT PERFORMANCE UNDER *Punishing Heat*



SOLID, LEAK-PROOF GASKET

Only Edison Spark Plugs have the patented, spun-on, solid copper gasket, always perfectly centered. Assures 100% compression-tight fit, and never needs replacement.

Faster cooling . . . more power without motor "ping" . . . hotter spark at highest speeds . . . greater fuel economy . . . premium performance with regular gas . . . longer life!

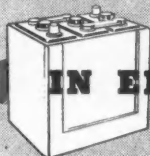
All these advantages are found combined only in the Edison HC (High Compression) Spark Plug . . . specially engineered to do an outstanding job under the punishing heat of modern high compression motors.

You'll be miles ahead in performance and dollars ahead in money saved with the Edison HC. Try just one set in your hottest job and compare! They cost no more.

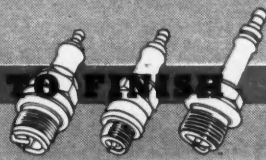
EDISON-SPLITDORF CORPORATION, West Orange, New Jersey



Edison SPARK PLUGS



IN ELECTRICITY, IT'S Edison FROM START TO FINISH



(CONTINUED FROM PAGE 72)

Never fail to report a severe contact with any obstacle, regardless of who is responsible.

10. Burned Valves

Between normal and necessary valve maintenance, the operator can help such conditions shown in picture No. 10 by refraining from running with choke partly open, over-riding speed of engine on downgrades, and racing or gunning engine when idling. Any sign of popping back or back firing through the exhaust line should be reported to the shop immediately.

11A. Burned Piston

Here is the start of a disastrous journey for a piston. The top ring land or groove and the top ring have been burned away. This action continues until the top butt of the piston is burned so badly that it "blows."

This is the point where an alert driver who is really an expert can play his part, as there is always a hiss, blow back or loud sucking sound through the intake manifold which sounds a general alarm requiring a prompt response, namely, to shut off the ignition switch, go into neutral and stop the truck—or else!

11B. Collapsed Piston

The damage shown in this picture is self-explanatory, and aside from material or mechanical failures, it can be brought about by over-riding engines and/or governor on downgrades; gunning engine and careless use of choke.

Driver Questionnaire No. 2

It is desired that all drivers fill in this questionnaire subsequent to talk delivered by a representative of the Automotive Section. Drivers and all interested are at liberty to consult the mimeographed outline of the above talk, which was passed out at the meeting, or any other source of information they desire.

The sole purpose of this questionnaire is that of fixing permanently in the minds of all driver personnel a better understanding of the costly and unsafe effects of improper handling and managing of the vehicle.

Please return within one week to plant office.

(A) GENERAL

(a) What was the general purpose of this talk?

(1) CRACKED CAB DOOR AND WINDSHIELD GLASS

(a) Name four ways to avoid breaking glass.

(2) FROZEN RADIATOR

(a) What is the only safe way to avoid this condition?

(b) Do you always check your antifreeze strength?

(3) OVERHEATED RADIATOR

(a) How would you avoid a situation of this nature?

(4) CRACKED CYLINDER HEAD

(a) What effect will cold water have on a hot engine or cylinder head?

(b) What is the best kind of head work under such circumstances?

(5A) DAMAGED RADIATOR SHUTTER

(a) What is the best way to avoid this condition?

(b) How many feet is considered a safe distance between running vehicles?

(5B) DAMAGED RADIATOR CORE

(a) What is the difference between this condition and the one outlined in No. 3?

(6A & B) DAMAGED FAN AND CORE

(a) In your opinion could this have been avoided?

(b) If yes, how? If not, why?

(7) CRACKED BELL HOUSING

(a) Under what circumstances can a bell housing be cracked by careless driving?

(8) BROKEN STEERING SPINDLE

(a) What would you have done under similar conditions?

(9A) BENT WHEEL

(a) Name three ways to avoid this error.

(9B) BROKEN BRAKE SHOES

(a) What can drivers do to help this condition?

(b) Did you ever before realize what damage fanning does?

(c) Aside from emergencies on (icy) roads would you fan the pedal?

(d) If the answer is yes—state reasons.

(10) BURNED VALVES

(a) What can a driver do to avoid this condition?

(11A) BURNED PISTONS

(a) Aside from mechanical reasons, what are a few conditions the driver can help in overcoming this type of failure?

(11B) COLLAPSED PISTON

(a) What sort of driving would be responsible for this condition?

Signed..... Station..... Date....

END

(Please resume your reading on p. 31)



NEW Taylor-Made Tire Chains on all 4 wheels save more lives—save more trucks—reduce damage liability. Owners are acting on the findings of the National Safety Council: New chains on front wheels as well as rear effect 50% to 80% more braking efficiency.

NEW

Taylor-Made

TIRE CHAINS

ON ALL FOUR WHEELS

mean **FOUR-FOLD SAFETY**—with **MONEY SAVING!** Chains on every wheel are the lowest priced insurance you can buy. Truck, Fleet, and Commercial Car owners specify **TAYLOR-MADE** Chains on their records, the result of the remarkable wear-resisting Quality of **TAYLORIZED STEEL**—Taylor Rugged Construction—quick "on-and-off" convenience. Get in touch with your Taylor Dealer and write us for Catalog and Prices.

T-M BAR-REINFORCED, REGULAR, AND EXTRA-HEAVY PASSENGER CAR, TRUCK AND BUS CHAINS, CROSS CHAINS, DUALS, AND T-M KWIK-ON ROD CHAINS, TWIST LINK AND TRACTO-GRIP TRACTOR CHAINS, EMERGENCY UNITS, TOOLS AND ALL REPAIR PARTS.

S. G. TAYLOR CHAIN CO.

HAMMOND

Established 1873

INDIANA

NEW!

IMPROVED SUPER-LUBRICANT

KEEPS ENGINES CLEANER
... LUBRICATES BETTER



LION

Naturalube

FOR DIESEL AND HEAVY DUTY

D.H.D.
OIL

Naturalube D. H. D. is made from a rare and basically different crude oil which imparts to the finished product a 3 to 10 times stronger protective film . . . greater adhesiveness and penetrativeness . . . and ability to remove hard carbon deposits. By special processing, Naturalube D. H. D. is reinforced or fortified to resist the deteriorating effects of extreme heat and oxidation. Results — engines are cleaner; rings and valves operate more freely for longer periods; no clogging of filters, screens or oil lines (i.e. clogging attributable to oil). There is no hard-carbon scuffing; general engine performance is greatly improved; operating and maintenance costs are lower; shut-down time is minimized. D. H. D. is non-corrosive — safe. It saves wear, adds power and saves fuel. Try D. H. D. — Your money back if you don't believe it to be the *best* oil you ever used!

Write for free brochure "New-Type Lubricating Oils" containing proof of Naturalube's money-saving properties and details of money-back guarantee. Address Advertising Dept., Lion Oil Refining Company, El Dorado, Ark.

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SPECIALLY PROCESSED!
REINFORCED!

- 3 to 10 Times Stronger Protective Film
- Removes Hard Carbon
- More Adhesive and Penetrative
- Non-Corrosive—Safe
- Keeps Piston Rings Free
- Adds Power, Saves Fuel, Saves Wear and Shut-Down Time

TESTED and APPROVED
BY LEADING ENGINE
MANUFACTURERS



Made By LION OIL REFINING COMPANY El Dorado, Ark.

STEEL TREATING

(CONTINUED FROM PAGE 34)

steel has become a very complex alloy.

It was also found, back in the days when metallurgists were trying to make armor and shields more lance-proof, that by cooling steel rapidly, the steel would be harder. The usual method of accelerating the cooling process was to quench the steel in water. Since that time oil and other

liquids, solids and gases have been used for quenching. More scientific methods of adding carbon, such as exposure to carbonaceous solids and gas have been developed of late.

During development of the quenching technique, it was found that with ordinary air cooling there comes a temperature vaguely described as "cherry red" or "the color of the rising sun" at which point the gradual cooling is suddenly arrested and the temperature may actually rise while

the steel becomes visibly hotter. After a brief period the cooling continues. The period of arrested cooling is called *recalcescence*. It was found that if the steel is quenched above the *recalcescent* point, it will harden. If it is quenched after the *recalcescent* period or below that temperature, the quenching will not harden the steel.

Since this *recalcescent* period covers a range of temperatures, there must be some point just above this range which represents the lowest temperature at which it is possible to harden steel by quenching. This temperature is called the *critical point*. Since there are many alloys used to make modern steels, there are many critical points, and anyone hoping to treat steel must know them and have the equipment to measure them. Metallurgists also know that .85 of 1 per cent of carbon gives steel the maximum hardening power through quenching. Slightly higher carbon content results in a harder steel but steels containing larger amounts of carbon are harder before quenching. The process of adding carbon to iron is called *carburizing*. Thus *carburized* steel is simply iron to which some amount of carbon has been added.

Heat treatment is an operation or combination of operations involving the heating and cooling of a metal or alloy in its solid state for the purpose of obtaining certain desirable characteristics. Since these characteristics are many and varied, the term "heat treatment" is a general or comprehensive term.

Annealing is the process of heating and slow cooling of a material. While the average mechanic thinks of annealing only in terms of softening a metal, it is actually done for at least six reasons. They are to remove stresses, to induce softness, to alter ductility (ability to be drawn into wire, etc.) or toughness, to refine crystalline structure, to remove gasses or to produce a definite microstructure. The amount of heat applied, and the rate of cooling, change and regulate the effect that the various processes of annealing will have on a given material. Among the various names given to different processes of annealing are: full annealing, process annealing, normalizing, patenting, spheroidizing, tempering.

(TURN TO PAGE 78, PLEASE)



American Safety Tanks have been "squeezing" the fire hazard out of the trucking industry since 1936.

Ask the men who use them—
the leaders in your industry.

American Safety Tank Co.

UNDERWRITERS LABORATORIES,
INC., A. U. 1302

KANSAS CITY, MISSOURI, U.S.A.

They'll help you **KEEP 'EM ROLLING**



Willard CHARGED BONE-DRY Batteries

Instantly Available for Emergencies

● When delivered to you, Charged BONE-DRY Willards contain no electrolyte—no moisture of any kind—they are as dry as a bone. All plates have been Charged and DRIED before assembly. These batteries are insulated with either Willard Rubber or Willard Dual Rubber, which contains no moisture. Even the vents are sealed to keep out atmospheric moisture. Because they *are* dry, chemical action within the battery is *suspended*. There can be no self-discharge—no deterioration. You avoid the cost of maintaining ordinary wet

batteries in stock. No matter when you need them, Charged BONE-DRY Willards are easy to put in service—just add electrolyte and charge for a short time. With this brief preparation they are as lively and fresh as the day they left the factory.

Charged BONE-DRY Willards are no untried experiment—millions of them have been built and sold in the past 25 years. They are available in a wide range of sizes and prices. For complete information phone your Willard distributor or write

WILLARD STORAGE BATTERY COMPANY • CLEVELAND, DALLAS, LOS ANGELES, TORONTO

(CONTINUED FROM PAGE 76)

drawing and malleableizing. Note that the term tempering is among the types of annealing and it does not mean to harden metal.

Case hardening means carburizing and subsequent hardening by heat treatment of all or part of the surface portions of a piece of iron base alloy. It is, for the most part, the same as other hardening except that it is done in such a manner that only the surface is treated.

Cyaniding is the surface harden-

ing of an iron base alloy by heating it to a suitable temperature in contact with cyanide salt, followed by quenching.

Nitriding is adding nitrogen to iron-base alloys by heating in contact with ammonia or other material containing nitrogen. The heating is below the critical temperature, and it produces a surface hardening without quenching.

The hardness of metal is tested by three different methods known as the Brinell Hardness test, the Rockwell

Hardness test and the Shore Hardness test. In the Brinell test a ball of .3937 in. in diameter is placed against the metal to be tested and a load of 6614 lbs. is applied to it for at least 10 seconds. The impression made by the ball is measured and indexed to a reading which describes the hardness of the metal.

In the Rockwell test a machine applies a load of about 22 lbs. to a ball or diamond cone. With some impression made, the dial gage is set to zero and a load of slightly over 330 lbs. is applied. The difference between the first impression and the second one is the measure of the metal's hardness.

In the Shore test a diamond point hammer is dropped from a given height and the rebound is measured on a scale running from 0 to 120.

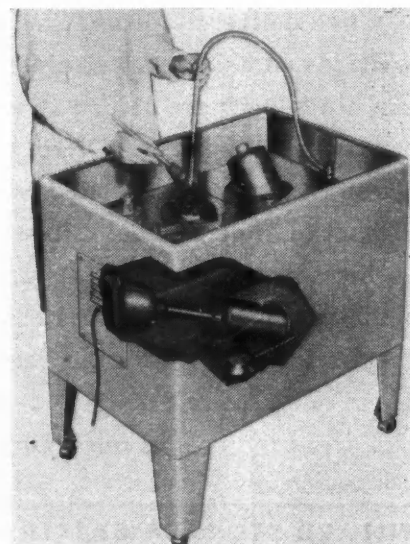
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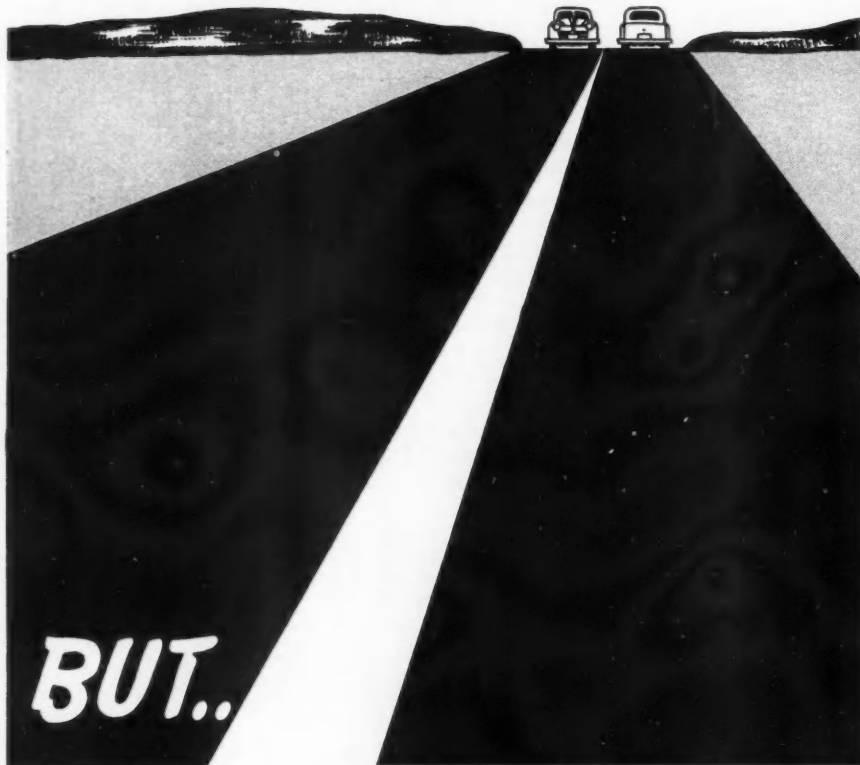
Mechanical Parts Cleaner

A mechanical parts cleaner which consists essentially of a metal washtub, a metal shelf for use with small parts, a centrifugal pump and filter is offered by Practical Products Co., 1629 University Ave., St. Paul, Minn. Any standard solvent can be used in the unit. The semi-rigid metallic tube through which the fluid is circulated frees both hands for cleaning operations. Pump is driven by a 110-volt A.C. motor of sparkless type. Sides of the tub are several inches higher than the operating shelf providing adequate splash protection.

The unit is offered in two sizes—Model K2, 18 x 24 in., has 8-gal. capacity and lists at \$49.50. Model K3, 34 x 36 in., has 10-gal. capacity and lists at \$69.50. Both prices are FOB St. Paul. For larger parts such as crankcases, axle assemblies, etc., a sturdy drain table 24 x 48 in. is available as accessory equipment with a 10-ft. extension hose.



THE WHITE LINE MAKES FOR GREATER SAFETY



IT STILL TAKES BRAKES TO STOP

You take a lot of pride in the reputation for road courtesy and safety that your drivers have built up. Have you given them the basic safety device . . . brakes they can really depend on? Today streets are better protected than ever before, but

—safety requires QUICK, SURE STOPS.

Ferodo Brake Linings give the most stops per dollar. They're reliable, they last a long time, and they're easy to install. Ferodo Brake Blocks are also available, in thicknesses $\frac{3}{8}$ inch and up, for heavy vehicles. Why not write us for full details? Today!

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has the answer to your

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SHORTAGE**



Have your Worn Tires Renewed by
this NEW FACTORY-CONTROL METHOD that
GUARANTEES *dependable* **EXTRA MILEAGE!**

★Kraft Renewing, now more than ever, represents a way to save on tire expenses. It is a proved method of keeping trucks on the road in spite of the current shortage on certain popular tire sizes. It presents an opportunity for you to help conserve rubber by getting the greatest possible mileage from every tire body—without sacrificing anything in terms of the operating efficiency of your fleet.

The Kraft System offers you more than just the services of a local recapper.

Every Kraft Shop operates under rigid factory controls that guarantee uniform quality throughout the country.

Reports from scores of fleets show that Kraft-Renewed tires frequently equal or exceed the mileage given by the original tread. You can get the same results on your fleet. Visit or call your General dealer today.

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AKRON, OHIO

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THE KRAFT SYSTEM IS AVAILABLE ONLY AT DISTRIBUTORS FOR

The

GENERAL TIRE

—goes a long way to make friends



A new special unit of a Heil "Trailerized" gasoline train has been placed in service by the Refiners Transport & Terminal Corp., Detroit. The train consists of two tanks and a powered dolly and has a total liquid capacity of 10,000 gallons; 5000 gallons in each tank. Each tank has two compartments with the front compartment having a capacity of 4000 gallons and the rear 1000 gallons.



Snap-on's NEW TORQOMETER



... brings "sealed-in" accuracy to every job ... saves time, safeguards workmanship

AGAIN Snap-on brings you an outstanding engineering advancement to simplify your daily work ... an absolutely accurate torque-gauge with accuracy sealed in! Revolutionary in principle, the new Snap-on Torqometer makes "tension-tuning" as easy as turning an ordinary wrench. You *always* get correct readings, time after time ... no matter how you work the tool.

Large, clear-view dial is visible from many angles, quickly pre-sets to any desired position. Slim but rigid head, and full-finger grip makes handling easy ... and the ratchet adaptor enables you to tension-set nuts accurately even where room for handle-swing is very limited.



Give faster service and safeguard your workmanship by "tension-tuning" every job with a Snap-on Torqometer. See your Snap-on salesman, or write ...

SNAP-ON TOOLS CORPORATION
8026-J 28th Avenue • Kenosha, Wisconsin

Snap-on

SERVICE TOOLS
The Choice of Better Mechanics

QUIZ ANSWERS

(See page 18)

1. c. Around 200,000 were ordered, of which 54,343 were actually shipped to Europe. About 40,000 trucks went to England, France, and Russia before the United States entered the war.

2. c. Prices of tires and tubes were frozen June 16 by the OPACS at the quotations then prevailing. The edict was subsequently modified to permit the 5 per cent boost.

3. a. The growler is a machine which produces an alternating current, setting up vibrations at the contact surfaces between the armature core and growler poles, resulting in a buzzing or growling noise. A growler will indicate grounds, short circuits, open circuits, reversed coils, etc., in the generator and starter ammeters.

4. b. The chain carries off static electricity. (It is not an I.C.C. requirement.)

5. b. Henry Ford made that statement a few years ago, and he has seen his prediction come true with the unveiling of an experimental Ford car with plastic body. Only steel in the whole superstructure is a welded tubular frame, carrying 14 molded plastic body panels. Common crops make up the typical formula for the new plastics—wheat, flax, ramie, hemp, spruce pulp. The car windows are a highly transparent plastic, like that in bomber plane windows.

6. c. The average cost of concrete highways in America is \$35,000 per mile, including the cost of the land. Compare the cost of concrete with asphalt at \$25,000 per mile, macadam at \$15,000, and gravel at \$10,000 to \$15,000.

7. c. A.M.A. horsepower. The letters stand for Automobile Manufacturers Association.

8. e. The lighter, by far. It uses 20 to 30 amperes. The headlamp uses 4 to 8 amps.; radio, 7 to 7½ amps.; spotlight, 3 to 6 amps.; windshield wiper, 2 to 6 amps.; heater, 1½ to 4 amps.; defroster, 7 amps.

9. a. Exposure to atmosphere. If gasoline is not stored in an air-tight vessel, the lighter constituents gradually escape, leaving a residue that cannot be used successfully in the carburetor. Such gasoline is said to be "stale." This staleness will occur in a carburetor if the gasoline is allowed to stand for a long time, and the stale gasoline must be drained before the truck can be started. Stale gasoline can be used for removing grease and dirt from the engine or other metal parts.

10. d. England. This fine quality clay is especially dug at and near Cornwall.

END

(Please resume your reading on p. 19)

Railway Express Orders Macks

Railway Express Agency supplemented previous purchases of 100 Mack trucks by ordering 135 more. One hundred of the new units are Model EEU cab-over-engine trucks and 15 are conventional Model EF tractors and another 15 of the same model are cab-over-engine.

POWER PILOT

(CONTINUED FROM PAGE 40)

Assuming the vehicle is in the low gear of the axle and the driver wishes to shift into the high gear, he will press the high gear button momentarily, this being done while he still is applying the engine torque. He has now preselected the high gear, but due to the fact that the torque is still being applied to the axle, the clutch collar remains engaged in the low gear pinion because the collar and pinion have interlocking type of teeth. By having pressed the button energizing the solenoid, the valve has shifted to a position which vents the diaphragm to atmospheric pressure and the spring is now pushing on the shift lever.

This pre-selection may be made at any time in advance of the moment when the driver will actually want to change axle ratios. When he wishes to make the change in ratios, it is then necessary for him merely to remove his foot from the accelerator treadle thereby obtaining a torque release which allows the shift collar to become disengaged from the low gear pinion, the spring pushing it out of mesh and holding it against the high gear pinion. The teeth on both pinion and collar have the ends machined perfectly flat, thus when the collar comes up against the pinion we have a condition of butting teeth. Since both driven gears of the secondary reduction are riveted to the differential case the high gear pinion will be running at a slower speed than the clutch collar and because of the squared end teeth the collar cannot get into mesh but merely revolves against the pinion. Since the driver has removed his foot from the accelerator treadle and has not depressed the clutch pedal, the slowing up of the engine will cause the clutch collar on the cross shaft in the axle to revolve at a slower speed, inasmuch as it is still directly geared to the engine. Meanwhile the momentum of the vehicle continues to revolve the high gear pinion. When the revolving speed of the clutch collar has been reduced to that of the high gear pinion, since they are rotating in the same direction and are now running at synchronized speeds, the collar will engage this

high gear pinion and the shift has been accomplished.

The shift lever now having reached the extreme position has contacted the pilot light switch and the pilot light on the control box in the cab is now illuminated, and the driver knows that he may resume acceleration.

While the above description of the shift is rather lengthy, the actual operation time involved is a matter of one or two seconds.

When the driver wishes to go back

into the low gear range of the axle, he pre-selects the gear ratio by pressing the low gear button. The solenoid then shifts the vacuum valve to a position which connects the diaphragm with the engine manifold and the diaphragm immediately exerts a pull on the shift lever, but as before it cannot become disengaged while the torque is still being applied.

When he wishes to accomplish the actual shift, it is necessary for him
(TURN TO PAGE 86, PLEASE)

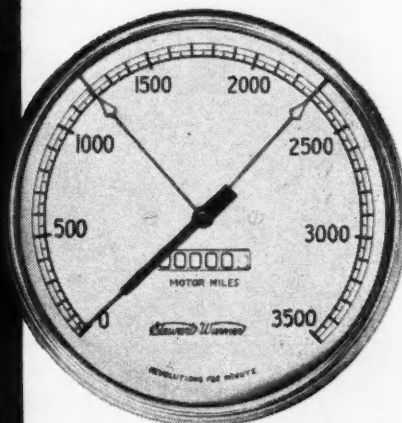


**THE DEFENSE PROGRAM MAY
MAKE NEW TRUCKS VERY
HARD TO GET... I'M TAKING
CARE OF WHAT I HAVE!**

**TRUCKS STAND UP LONGER
when serviced on a basis of
MOTOR MILES!**

*Let this Amazing
MOTOR MILE TACHOMETER*

- ✓ lengthen truck life
- ✓ cut repair expense
- ✓ cut fuel and oil expense



THERE'S no knowing how long you'll have to drive your *present* trucks! Keep them rolling in top condition—with lower maintenance cost—with lower fuel cost—by installing Stewart-Warner Motor Mile Tachometers!

Actual records of users show that such savings result from *knowing the power and economy range* and keeping the motor speed within that range—and by servicing trucks on a basis of

actual motor miles instead of speedometer miles!

Drivers appreciate the ease of keeping the motor speed indicator between the two red pointers which indicate, at all times, *the limits of the economy range*. They like the better performance records of trucks which are equipped with the Stewart-Warner Motor Mile Tachometer. Mail the coupon today for complete information!

**STEWART
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**MOTOR MILE
TACHOMETER**

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I operate _____ trucks. Please give me all the facts about longer truck life and lower operating costs with Stewart-Warner Motor Mile Tachometers.

Name _____
Address _____
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THEY KEEP ROLLING LONGER with AC Spark Plugs under the hood

On file at the AC plant are hundreds of documentary proofs that AC Spark Plugs assure greater reliability on the road. Fewer delays, more "on time" runs, and elimination of spark plug *headaches*, always follow the adoption of AC recommendations.

AC's field engineers constantly check with fleet operators to make sure that the right plugs for the job are being used, and the right maintenance procedure followed. Yet, so simple is the AC "formula" for satisfaction, any operator can get results by following this 3-step plan:

1. Clean, check, and regap all spark plugs every 4,000 miles. Dirty or worn plugs waste power up to 21%—and as much as 1 gallon of gas in every 10.
2. Be sure that the Heat Range of the plugs is correct for the job. Excessive fouling or sooting show that "hotter" plugs are needed. Rapid wear and

preignition are sure signs that "cooler" plugs are required. You can eliminate these common causes of spark plug failure by choosing the AC plug of the correct Heat Range for your engine.

3. Always use quality plugs. AC quality is widely accepted by leading car, truck, and bus operators and manufacturers. Nearly one in every two cars, buses, and trucks built in 1940 was factory equipped with AC plugs. The plugs that satisfy engineers are sure to give the best in dependable service and long life.

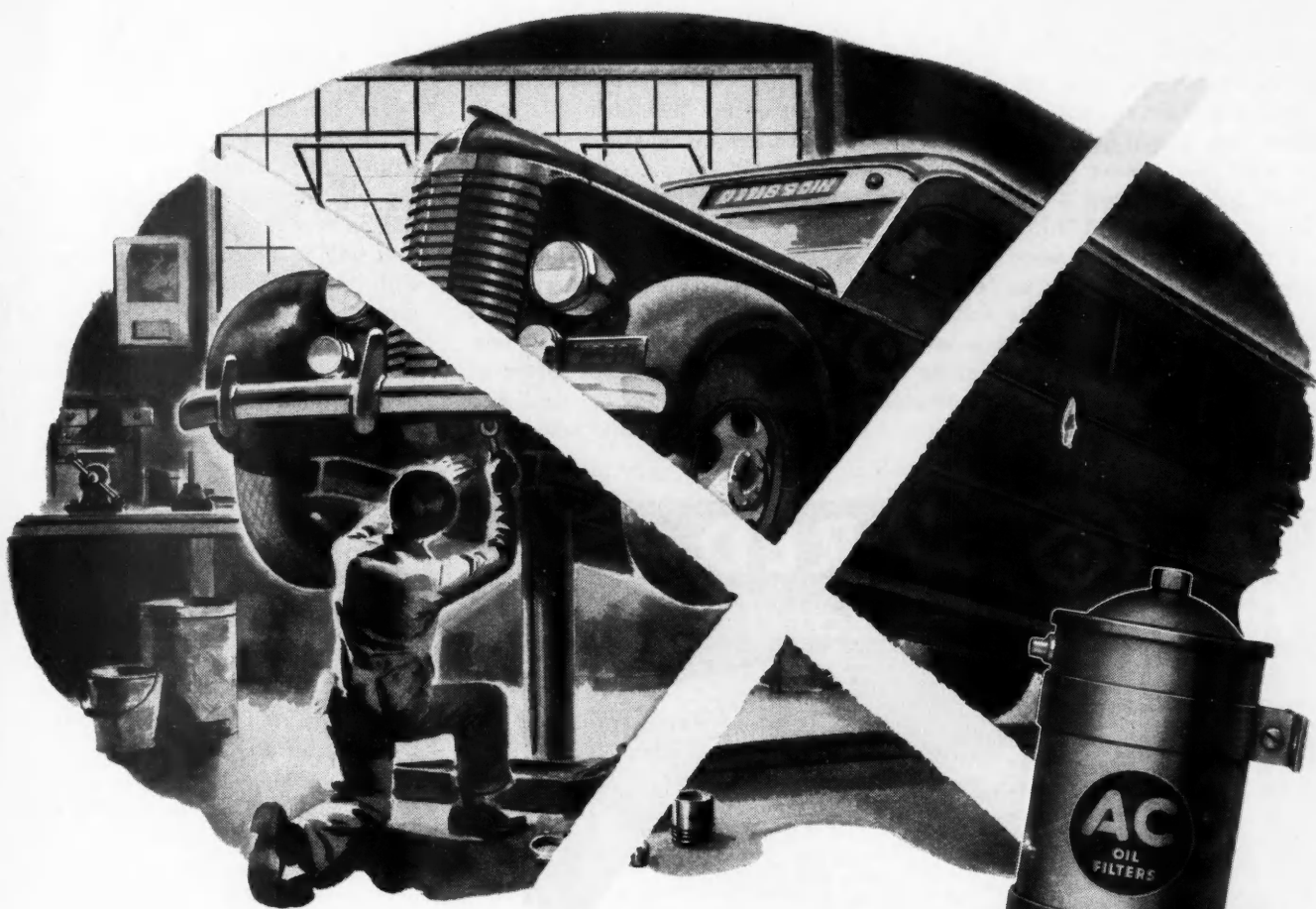
For full reliability, and greatest plug economy—
Consult your AC Supplier today

For More Than 33 Years THE QUALITY SPARK PLUG

Chevrolet, Diamond T, Federal, GMC, and International Trucks; Buick, Cadillac, Chevrolet, Nash, Oldsmobile, and Pontiac motor cars; Allis-Chalmers, J. I. Case, Cletrac and International Harvester Tractors... these are some of the well-known trucks, cars, and tractors which use AC Quality Spark Plugs. Trust your spark plug requirements to the same brand of spark plugs which the leading, big-volume manufacturers select.

AC SPARK PLUG DIVISION • General Motors Corporation • FLINT, MICH.

More AC's are used as standard factory equipment than any other make of spark plugs



FEWER ENGINE OVERHAULS with AC Oil Filters on the job

If a ring job means an average of seven hours in the shop, and an AC or Argo Oil Filter can definitely postpone that expensive operation,—that filter pays its way in a very short time. And hundreds of fleet cost records prove that that's exactly what happens!

AC or Argo filters prevent the clogging of oil ring slots by keeping sludge and dirt out of the oil. Clean slots mean that oil rings can perform their function longer. Compression is held high. Gas and oil economy are protected. Carbon formation is retarded.

Furthermore, the oil is kept in good condition,—clean, and free from discoloration.

We invite you to check these statements. You will find AC or Argo filters a sound investment. Installation is quick and easy. Element replacement requires no disconnection of fittings, or dismounting.

Hold down overhaul expense with AC or Argo Oil Filters.



Your AC Supplier can Furnish all Commercial Sizes

AC OIL FILTERS are standard or optional equipment on—BUICK, OLDSMOBILE*, and PONTIAC* Motor Cars • GMC Trucks • GREYHOUND and FLEXIBLE Buses • ALLIS-CHALMERS, EAGLE, GRAVELY, and READY POWER Tractors • ATLAS IMPERIAL and GM DIESELS • CONTINENTAL and GRAY MARINE MOTORS • MARION SHOVELS • KOEHRING ROAD MACHINERY • BROWN and SHARPE MACHINERY,—these are some of the vehicles, power plants, and machines on which AC Oil Filters are used for equipment.

*Optional

AC OIL FILTERS SAVE YOU MONEY EVERY MILE!

(CONTINUED FROM PAGE 83)

to release the pressure on the accelerator treadle, momentarily, which allows the diaphragm to disengage the high gear pinion and move the clutch collar against the low gear pinion. In the case of shifting to the low gear of the axle, since the engine is necessarily going to require a greater RPM to keep the vehicle moving at the same speed, it is not necessary for the driver to hesitate before he resumes acceleration. He, therefore, merely relieves the pres-

sure and immediately presses down on the treadle. Again he refrains from depressing the clutch pedal and, therefore, as his engine accelerates so the clutch collar in the axle will accelerate and when it has reached an RPM equivalent to that of the low gear pinion, it will slide into mesh, engaging the pinion with the cross shaft and the shift has been completed and the vehicle is now operating in the low gear range of the axle. This shift is accomplished in a fraction of a second which can

only be measured by electrical timing devices.

The fact that the vehicle clutch is not disengaged in making either shift will result in a saving of clutch facings which, of course, means reduction in cost of operation.

It will be noted that the low gear shift is a very fast operation and this, of course, is very desirable because this shift is usually made when a grade has been encountered and more reduction is necessary. Since the shift is so fast there is no loss of vehicle momentum such as is always the case with the hand shifting type of two-speed axles. Also this shift is accomplished by the vacuum which is at a peak at that particular instant due to the fact that the driver has closed the throttle, momentarily decelerating the engine, thus rapidly evacuating the pipe line and the diaphragm. It is then kept evacuated by means of a check valve.

The speedometer shift, to compensate for the change in rear axle ratio, is accomplished by means of a small diaphragm actuating the regular type of speedometer transmission used with two-speed axles. This diaphragm is piped to the same vacuum valve which operates the shift diaphragm, thus both speedometer and axle are shifted simultaneously.

END

(Please resume your reading on p. 42)

BE PREPARED for Winter Hazards!

"3.342 Defrosting Device
Every motor vehicle which is equipped with a windshield, when operating under conditions such that ice or frost would be likely to collect on windshield, shall be equipped with a device or other means for preventing or removing such ice or frost." See page 47, ICC Motor Carriers' Safety Regulations, Revised.

TODAY, more than ever, it is important that the hazards of winter truck operation be reduced. Equip your fleet with either (or both) of these safety accessories:

FULTON ELECTRIC SLEET-FROST SHIELD

Keeps its space on inside of windshield clear of frost and steam without use of electric current. Melts snow and ice on outside of windshield by switching on current. Highest quality construction. Metal frame is equipped with rubber seal.

No. 1-F3, illustrated, with 4 heating wires, complete with cord.

List Prices - - 6-volt, \$3.65 - 12-volt, \$4.00

No. 496 DEFROSTING FAN

Unexcelled for keeping inside of windshield and cab windows free of both frost and steam. Also valuable for cooling and ventilating in hot weather. Universal type curved bracket permits mounting in choice of four directions at any point where attached . . . on steering post, instrument cowl, headerboard, WINDSHIELD CENTER POST or WINDSHIELD FRAME. Two-blade 6" fan (non-overlapping soft rubber blades) moves large air volume and permits greatest visibility of road and instrument panel. Streamlined, two-tone "Tiffany" finish motor case with fittings to match. Specially wound 2-speed motor.

List Prices - - 6-volt, \$4.90 - 12-volt, \$5.45

Order from your jobber or write us direct if he cannot supply you.



Steering Post Installation Attached to Windshield

Weather Forecast
SNOW -
SLEET -
FROST -
All Winter Long



No. 1-F3 Electric Sleet Frost Shield



No. 496 Fan

Licensed under U.S.
Pat. No. 2,095,223
Canadian
Pat. No. 370,548



Van Norman Promotes Crowder and Bausch

C. R. Crowder, formerly automotive sales manager of Van Norman Machine Tool Co., Springfield Mass., has been promoted to manager of the automotive division and T. W. Bausch has been made assistant manager of the automotive division.

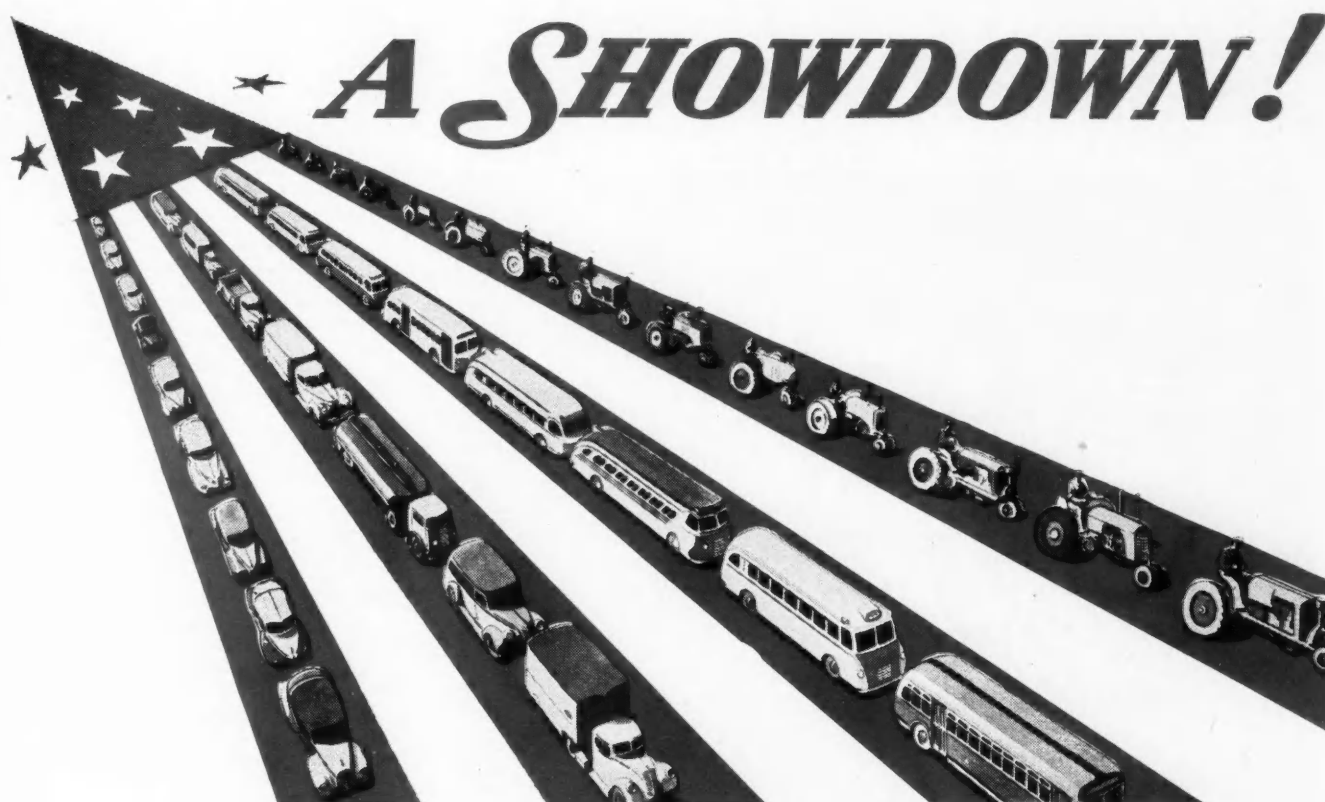
Alcohol Gas N.G.—F.D.R.

In reply to a joint resolution of the California legislature urging the erection of plants for the conversion of surplus fruits and vegetables into alcohol for use in the national defense as auxiliary fuel, the President declared that it has never been established that alcohol gasoline is economically feasible or necessary for national defense.

THE FULTON CO. 1912 South 82nd Street
Milwaukee, Wisconsin

This year -

instead of an automobile show—



YOU who build or sell or service America's motor cars and trucks and tractors *know* the important part that the automotive industry is taking in this grim game of showdown.

But in this historic year, it isn't all flags and drums, guns and tanks, ships and planes...

There is that vast army of men and machines whose job is providing *transportation*... wheels that must roll to keep flowing the life-stream of parts and materials and food and clothing.

On this front, too, the automotive industry

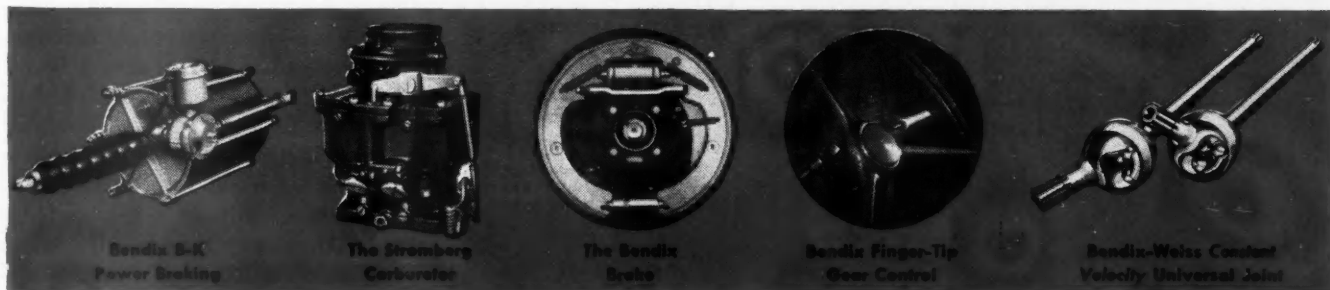
stands firm at its appointed post; ready and able to produce, equip and maintain the automotive transportation of America. And on this front, particularly, Bendix is proud and thoroughly able to serve the great American industry upon which the nation has placed such heavy responsibility with such complete confidence.

So in this year of the Big Showdown, we say—as we have said in the years before, and shall continue to say in the better times to come—

Call on Bendix!

Bendix Products

BENDIX PRODUCTS DIVISION OF BENDIX AVIATION CORPORATION, SOUTH BEND, INDIANA



Bendix B-K
Power Braking

The Stromberg
Carburetor

The Bendix
Brake

Bendix Finger-Tip
Gear Control

Bendix-Weiss Constant
Velocity Universal Joint

WASHINGTON OVERLOAD

(CONTINUED FROM PAGE 19)

Yardstick for Makers on Interchangeable Parts

Perceiving that parts makers have a problem on their hands allocating materials for like parts having both an A-3 and an A-10 priority rating, the Division of Civilian Supply of

OPM has worked out a yardstick. On the basis of this yardstick, 20 per cent of materials intended for parts that are interchangeable should be ordered with the A-3 priority and 80 per cent with the A-10. The ratio takes in mileage and other factors that vary among light, medium and heavy trucks. Manufacturers having a more accurate method of calculation have the privilege of taking their case to OPM.

The yardstick is to be used only

when parts manufacturers do not know the priority rating of the vehicles for which the parts are ordered.

Separate Army Motor Transport Corps?

Transportation men are properly curious about the presence in Washington of John Hertz, of Hertz Drive-Your-Self fame. To satisfy their curiosity it can be reported that Mr. Hertz is in Washington at the invitation of the Under-Secretary of War; that he is ably assisted by practical transportation men in making a study of army motor transport. The study should be completed by the end of October and will form the basis of a momentous decision by the Secretary of War. It may be that the decision will be to take control of army motor transport from the Quartermaster Corps and give it to a separate Motor Transport Corps. The magnitude of the job expected of motor transport is such that it logically poses the question which Hertz and his associates have under taken to study.

Mystery: What Became of Truck Consultants?

Hearing that a mystery surrounded the truck and bus consultants to Ralph Budd, whose transportation department is all that remains of the Advisory Commission to the Council of National Defense, your correspondent donned his gumshoes and went on the trail of a story that turned out to be fantastic. The facts appear to be these: With the formation of the Central Motor Transportation Committee someone on Mr. Budd's staff concluded that it would do nicely as the consulting body and consequently there would be no further need of the three truck and bus consultants—Messrs. Rodgers, Horner and Hill, all of whom were also on the Central Committee. These consulting jobs pay the munificent sum of \$1 a year—and if that ain't hay, what is? Well, you'd imagine that after having made personal sacrifices to serve as consultants they'd be entitled to some consideration—even from railroad men on leave-of-absence. But no, all three men were dropped as consultants without official notification, without fore-knowledge and without any acknowledgment of

(TURN TO PAGE 90, PLEASE)

**Upsets all precedents
Startling cost reductions
Amazing mileage records
New! Better! Modern!**
At Last

● Here is the revolutionary new truck tire for which you have been waiting! Extra tough carcass of Pennsylvania's Super-test Cord gives 30% more strength. Dual Purpose Tread checks heat and gives longer wear. Exclusive new Super-Pressure Curing Process makes tread amazingly resistant to shocks and abuse.

Convince yourself . . . test a Turnpike under actual operating conditions. You'll find it all we claim . . . and more!

PENNSYLVANIA RUBBER CO.

General Offices & Factory: Jeannette, Penna.

PENNSYLVANIA
Turnpike
TRUCK TIRES



Specify THE CRANKSHAFTS THAT
GO 241,631 MILES AND
SHOW ONLY .0004" WEAR!

5 TO 10 TIMES LONGER LIFE

● Illustrated is one of thousands of TOCCO-hardened crankshafts that are saving operators of gasoline and Diesel engines hundreds of dollars in maintenance costs. The enduring characteristics of the TOCCO Process of surface hardening enable crankshafts to pile up performance records of over 200,000 miles with hardly enough wear for the average shop to measure. Five to ten times more useful life is commonplace.

With defense deliveries demanding full speed ahead, it will pay you to specify TOCCO-hardened shafts in

your new trucks or buses. They'll cut down lay-up time by eliminating complete motor overhauls just to fix an "out-of-round" crankshaft. That's one reason why Autocar, Cummins, Hercules, General Motors Truck & Coach, White, and other leading engine makers use TOCCO-hardened shafts. These manufacturers know that TOCCO hardening insures their customers extra miles by the thousands.

Specify TOCCO-hardened crankshafts.

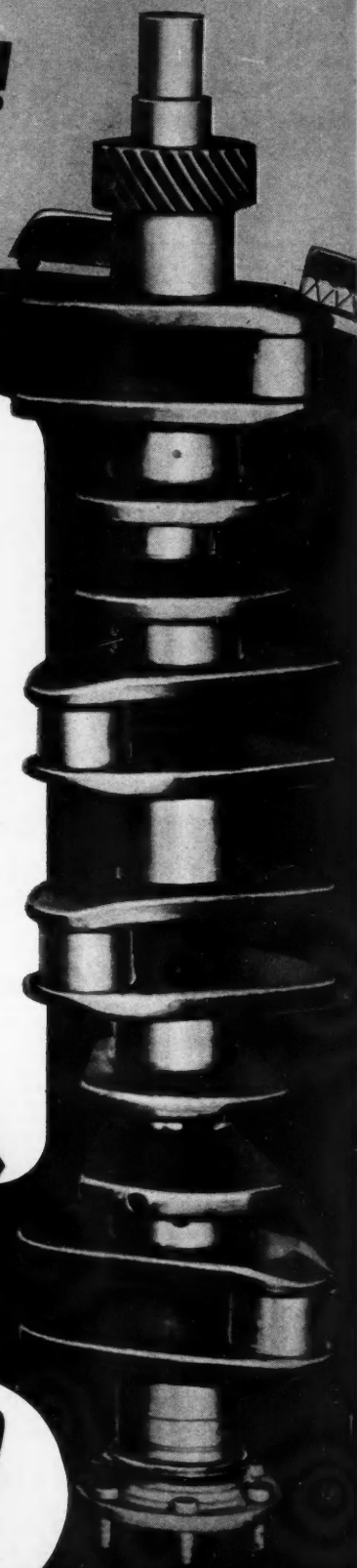
Photograph of TOCCO-hardened crankshaft after 241,631 desert miles in a well-known make of truck. Crankpin showed only .0004" wear. This is typical of TOCCO'S resistance to high speed, heavy loads and long miles.

THE
OHIO CRANKSHAFT
COMPANY

Cleveland • Ohio

TOCCO

"Why Heat Treat the Whole Piece?"



(CONTINUED FROM PAGE 88)
the sacrifices they had made. The pay-off is in the story that Mr. Budd did not know his truck and bus consultants had been liquidated until some one astonished him by asking the question. He learned then that it was an accomplished fact.

New Tax Bill Does Not Slight Fleets

The 1941 Federal Revenue Act is now on the books and it does not

overlook fleet operators. Old taxes are increased and new taxes are imposed. New taxes include a \$5 use tax on motor vehicles; 5 per cent excise tax on truck trailers and semi-trailers; nuisance taxes on fares when you travel, on long distance telephone calls, on telegrams, on light bulbs and whatnot. Increases in existing automotive excise taxes include: Trucks—from $2\frac{1}{2}$ to 5 per cent; passenger cars—from 3 to 7 per cent; accessories and parts—from $2\frac{1}{2}$ to

5 per cent; inner tubes—from $4\frac{1}{2}$ cents per lb. to 9 cents; tires—from $2\frac{1}{2}$ cents per lb. to 5 cents.

The Federal gasoline tax remains at $1\frac{1}{2}$ a gallon. The proposal to boost it another cent was defeated.

P.S.—Don't forget to fill out the truck census forms that should have reached you by now. Mailings to truck users were made on Sept. 25 in all but a few states. Fill the forms out now and get the job over with.

END

(Please resume your reading on p. 20)

NEWSCAST

(CONTINUED FROM PAGE 64)

S. E. Gane has been appointed manager of the new sales office of the Gould Storage Battery Corp. just opened in Pittsburgh, Pa. He was a sales representative of the company for 20 years



Trucking in the News (National)

Several events of national significance to the trucking industry have taken place in Washington in the past few weeks. The first of these is an effort to draft the nation's distribution facilities for national defense. This is where trucks are playing their most vital role, and to that end an inventory of trucks and buses is to be made throughout the country. More than six million questionnaires will be required in the national canvass which state motor vehicles registration agencies will conduct. Information requested will be held strictly confidential and will be used only to set up detailed central and regional records of motor vehicles.

Also from Washington comes news of a Wage and Hour Division recommendation that a 40-cent-an-hr. minimum wage be established in interstate trucking. If approved after a public hearing soon to be scheduled, it will affect 70,000 workers.

(Local)

Things looked bright for Pennsylvania truckers when legislators of the Keystone state approved a bill to modernize its transportation law. But Governor A. H. James and his "horse and buggy highway department" thought otherwise and vetoed the bill. The Pennsylvania Motor Truck Association promptly held a special meeting and speedily approved a resolution (Harrisburg, Aug. 25) memorializing Congress to approve ICC's recommendation for Federal intervention to abolish trade barriers, in order to smash Pennsylvania's transportation bottleneck. Pennsylvania truckers want higher weight limits; streamlined transportation laws.

(TURN TO PAGE 92, PLEASE)

Now! STRENGTH AND BEAUTY WITH LESS WEIGHT . . .

The Plymetl Body, when mounted on the now famous Kingham R-30 Chassis, forms a semi-trailer unit of unusual strength, durability, beauty and light weight.

Kingham Universal PLYMETL BODY

The New Kingham-Universal Plymetl Body was designed and marketed only after a long and careful study by Kingham engineers of suitable materials and designs that would meet the ever-growing demand of the trucking industry for a single trailer unit that would be a combination of strength, beauty, and light weight.

Plymetl, the material from which the panels of the body are made, is a water-proof bonded plywood with a highly rust resisting smooth metal face. A good sound blow with a rubber mallet on a piece of Plymetl, tells you quickly and dramatically why this is the ideal body material. Despite its remarkable light weight, there'll be no dent—no distortion of the smooth, flat surface. Plymetl is nationally known for its extremely light weight, its strength and its durability.

The side and front end panels of the Plymetl Body are exceptionally strong and commercially PERFECTLY SMOOTH. Added strength is given the front end panels when they are formed. This additional front end strength is one of the features of the new body.

The panels are securely bolted to upright high tensile steel stakes. This type of construction eliminates rattles and other unnecessary noises. The new type of molding which covers all joints and bolt heads adds greatly to the appearance of the unit.

The Plymetl body has a standard Kingham-Universal all-steel roof.

Besides being the most beautiful body ever produced by the Kingham Trailer Company, the Plymetl Body is lighter in weight and has an exceptional carrying capacity.

Before you purchase your next equipment be sure to carefully consider the extra value built into this outstanding new light weight Plymetl Trailer.

There is a Kingham Distributor near to serve you. Call him for a demonstration today or write direct to Kingham Trailer Company, Louisville, Ky.

Descriptive literature sent FREE upon request.

"A Load Behind is a Trip Ahead"

KINGHAM TRAILER COMPANY

INCORPORATED

LOUISVILLE, - - - - - KENTUCKY



GET HORSEPOWER READY FOR WINTER

WHAT CASITE DOES

Frees sticky valves and rings

• *Improves gasoline mileage •*

Cleans out sludge and gum . . .

and keeps them out • Retards

formations of engine varnish •

Improves lubrication • Makes

motors start easier and quicker

in winter weather • Breaks in

new or reconditioned motors.

● Casite cuts down winter motor worries—improves performance and increases gasoline mileage. Better yet, in tests recently concluded, Pittsburgh Testing Laboratory proved that Casite gave faster starting with less battery drain at zero.

Casite does two simple, fundamental things for any motor: (1) it quickly cleans power-destroying sludge and gum from vital parts; (2) though not a lubricant, Casite's oil-carrying ability speeds lubrication to high-friction, close-clearance parts in the coldest weather.

Thousands of thoughtful fleet maintenance men have discovered the value of continuous use of Casite . . . and keep it in every motor, all the time.

Put Casite in the crankcase with each oil change and tune-up through the carburetor each 5000 miles.

THE CASITE CORPORATION • HASTINGS, MICHIGAN

CASITE

CLEANS OUT MOTORS • KEEPS MOTORS CLEAN

(CONTINUED FROM PAGE 90)

Recapitulation On Retreading

Figures compiled by the Rubber Mfg. Assn. claim 4500 retreading plants in the U. S. are annually doing \$45 million worth of business. The phenomenal growth of the business is attributed primarily to efforts of truck operators to reduce tire costs.

Auto-Lite in Safety Contest

For the second time Electric Auto-Lite Co., Toledo, will donate prizes for the ATA Truck Safety Contest. Safety directors whose fleets place first or second in the following classifications will receive

awards: Local fleets operating in metropolitan areas, with operations totaling 50,000 to 100,000 miles; 100,001 to 200,000 miles; 200,001 to 300,000 miles; 300,001 and over. Trucks operating over larger areas with operations totaling 300,001 to 500,000 miles; 500,001 to 1,000,000 miles; 1,000,001 to 2,500,000 miles; 2,500,001 and over. First prizes are rewarded with chronograph watches; second prizes with desk sets.

Trailmobile Contest

Trailmobile has elaborate plans for its safety contest conducted under the auspices of the ATA. Operators participating will be furnished posters, buttons for

drivers, letters for mailing to shippers and other material.

Motorized 28th

The 28th Division will begin its maneuvers this month with every soldier riding instead of walking. It will require 2457 trucks and buses to transport the 18,000 men 530 miles (two and a half days) to North Carolina where the soldiers will test their training.

United Motors Service has upped V. A. Dupy to general merchandising manager of the company. E. O. Graber will succeed Dupy as manager of the Detroit branch



Personalities

O. V. Chapman has rejoined Reo Motors, Inc., as manager of its Dallas, Tex., branch.

Malcolm McCormick, formerly vice-president of Walker Mfg. Co., Racine, Wis., has joined the Fram Corp., Providence, R. I., as manager of the National Defense Division. He will coordinate the efforts of New England companies cooperating with Fram in "pooling" of manufacturing facilities for defense production.

Earl G. Gunn, formerly an advisory engineer for Fram, will take full charge of Fram engineering for national defense.

Fred R. Cooper has been appointed assistant to the president of Willys-Overland, Inc.



Harold G. Smith has been appointed chief engineer in charge of all engineering of automotive, marine, industrial engine and radial engine diesel division of the Buda Co.

C. A. Ohl becomes assistant general manager of the Bendix-Westinghouse Auto. Air Brake Co.

General Motors announces the following appointments: L. C. Goad as assistant to the vice-president in charge of car and truck group; F. L. Burke, assistant to vice-president in charge of the accessory group; C. A. Michel as factory manager of the Guide lamp division; H. W. Anderson as general assistant to the vice-president in charge of personnel staff.

Canadian Trucks for Army

Five Canadian military models were purchased by the U. S. Army to study their construction and design. The vehicles were used by the British in Egypt and are especially adapted for desert warfare.

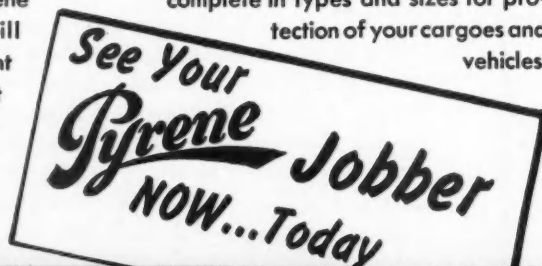


Manufacturing is—and will be—unpredictable. Steel is hard to get. Chain factories are busy on government work. At any moment, and particularly if the winter is severe, an acute chain shortage will develop.

But you need chains, to assure deliveries on the biggest, fullest schedules in your history. Get them. Order chains now, while you can get delivery. See your Pyrene jobber and know that you are safe. If you have chains, order cross chains and parts. And order them from a Pyrene jobber for these two reasons:

① Pyrene users rely on the famous Krick weather forecasts—month-ahead predictions and flash warnings of sudden changes—posted at Pyrene chain jobbers. They will save you money, prevent delays, and protect your income—just as Pyrene chains themselves will do.

② Pyrene chains are made for heavy duty service. They will give you all the miles per dollar that can be bought. They are complete in types and sizes for protection of your cargoes and vehicles.





CoMaX is not just another brake lining. It is a superior quality product having the following features and advantages:

- 1. CoMaX IS LONG LIVED.** It wears slowly and gives longer service.
- 2. HAS REINFORCED BACKING.** Permits deep seating of rivets and increases thickness of lining available for braking service.
- 3. NON-COMPRESSIBLE.** Does not compress under brake pressure. Brakes lined with Wagner CoMaX run for long intervals without needing adjustment.
- 4. UNIFORM IN TEXTURE.** As the lining wears, the same type of brake surface is always exposed to the drum.
- 5. EASY ON DRUMS.** Contains no abrasive material.
- 6. EXCELLENT FOR HIGH SPEEDS.** Maintains its perfect performance under severe braking conditions.

7. QUIET. Grips silently. No howling or squealing.

8. SMOOTH. Uniform friction permits even, controllable deceleration.

9. AGE-PROOF. Does not deteriorate with age.

10. RIGIDLY TESTED. Wagner maintains 26 proving grounds.

The Wagner background of 16 years' research and experience in brakes is reflected in the amazing way that CoMaX stands up in service. CoMaX is available in slabs, blocks, rolls and sets.

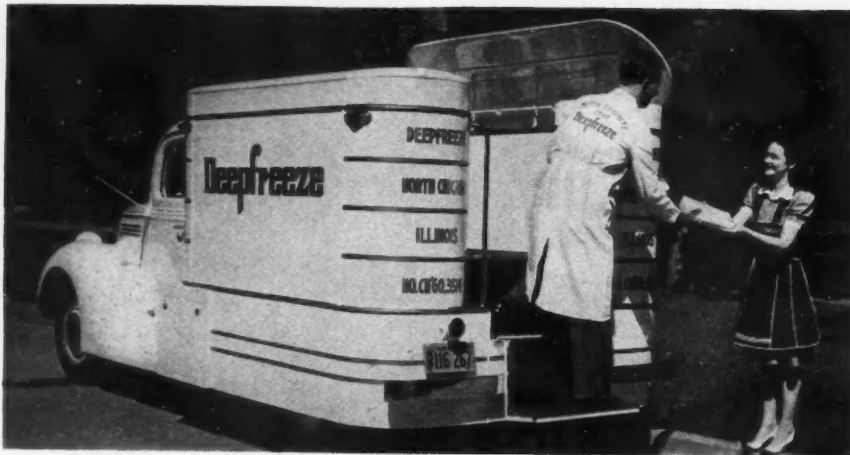
Don't delay! Ask for a copy of the big 1941 Wagner CoMaX Catalog BU-43. It is unusually complete, gives specifications, prices, and etc., for trucks, buses, and passenger cars. It's FREE, so ask for a copy NOW!

B41-28

AUTOMOTIVE
PARTS DIVISION

Wagner
ELECTRIC CORPORATION

6400 PLYMOUTH AVE.
ST. LOUIS, MO., U. S. A.



Designed especially for transportation of frozen foods to consumers, this interesting body job is manufactured by the Henney Motor Co., Freeport, Ill. Available in two sizes, one model has a 36-cu. ft. and the other a 77-cu. ft. capacity. Body models are planned for both c.o.e. and standard chassis

SLUDGE: HIGH AND LOW TEMPERATURE

(CONTINUED FROM PAGE 21)

products of decomposition of the oil, due to the oxidation and decomposition of the oil at elevated temperatures. The objection to high temperature sludge is not so much to the sludge itself but to the oil decomposition products which accompany it. When oil oxidizes it tends to form acids, which may be corrosive. It may form varnish which may stick the pistons to the cylinders so tightly that it may be impossible to operate the engine. It may form resins or gums which are soluble in the oxidized oil, but when fresh oil is added to this oxidized oil, either to maintain the level or when the crankcase is drained and fresh oil is added, these resins may be curdled and precipitated. These curdled deposits, on mild heating in the crankcase soon become hard and brittle, forming the very objectionable "coffee-grounds" that are sometimes found in a crankcase. These "coffee-grounds" are usually in large enough particles so that they can clog oil passages and cause burned out bearings.

There are several obvious solutions to the high temperature sludge problem, but for various reasons some of these solutions may not be desirable.

1. One unsatisfactory solution is to avoid high speeds and heavy duty which might produce elevated temperatures.

2. Another solution might be for automobile engines to lower average engine temperatures, but if this puts us back into low temperature sludge troubles, such as crankcase corrosion, etc., it would be undesirable.

3. Another solution might be to retain the advantages of a quick warm-up but to decrease the maximum temperatures by the use of oil coolers. Oil coolers are in general use on airplanes, tractors, diesel engines, etc., and several years ago we

(TURN TO PAGE 96, PLEASE)

Join the Parade to WEATHERHEAD

THREE SOUND REASONS MAKE WEATHERHEAD YOUR CHOICE OF REPLACEMENT FITTINGS:



YOUR jobber carries both—Weatherhead original equipment replacement fittings and Weatherhead fuel lines in coils or ready-to-install lines with fittings attached. When replacements are necessary—just specify Weatherhead.

THE WEATHERHEAD CO.
300 East 131st St., Cleveland, Ohio



WE HELP TO KEEP 'EM ROLLING!



For Better Protection IT'S

STREAMLINED CLEARANCE LAMP



Modernistic, 3-in-Line, clearance or fender lamp. Heavy gauge metal construction. Rubber pad mount permits fitting to curved or flat surfaces. Battery drain reduced 50% by use of 1 1/2 C. P. bulb in scientifically designed lens. Meets S. A. E. requirements.
No. 1203 List Price \$1.25

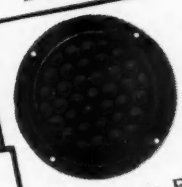
FLEX-FIT 3-WAY TRUCK AND BUS LIGHT



All-rubber body and contact strips . . . molded into one inseparable unit . . . shockproof, rustproof and waterproof. Flexible . . . fits either curved or flat surfaces. Specially designed 2 1/4 inch lens throws light straight forward, also at 90° angle.
No. 1132R . . . List Price \$2.50

DO-RAY

NOBBY REFLEX SIGNAL



For trucks, busses and trailers. Molded, one piece lens is protected by metal mask. Will withstand the most severe abuse, salt water, acid, heat and cold. Passes all S. A. E. and E. I. S. tests. Furnished in red, amber, green or white.
List Price \$1.00
No. 1292

STURDI-BUILT MIRRORS



Can be extended 39 inches. Heavy, rubber guard absorbs shocks—reduces danger of damage to mirror. Adjustable to any position. Silver luster finish. Complete with clearance lamp
No. 1329—List Price \$3.75

THE WAY

For NATIONAL DEFENSE . . .

TRUCK TRANSPORTATION IS VITAL TO THE NATION'S DEFENSE! Are YOUR motor vehicles properly protected against the "sabotage" of traffic accidents? A smashed truck, an injured truck driver, hinders the nation's defense program.

DO-RAY CERTIFIED TESTED AND APPROVED SAFETY LIGHTING AND EQUIPMENT add to the safety of all trucks, large and small, on city streets and highways. DO-RAY PRODUCTS are designed to conform to all motor vehicle lighting and safety regulations.

Among the safety lights and equipment, selected by the U. S. Government for the mobile units of its mechanized forces, are DO-RAY PRODUCTS . . . DO-RAY are pioneers of all around vision lamps and other leading safety equipment used by America's largest fleet owners.

Avoid delayed deliveries. KEEP YOUR TRUCKS ROLLING! Check them now! Get needed DO-RAY SAFETY LIGHTING AND REFLECTING EQUIPMENT where you buy your automotive supplies.

If you cannot get DO-RAY EQUIPMENT conveniently—write direct to the manufacturer.



DO-RAY

LAMP COMPANY

1458 S. Michigan Ave., Chicago

SAFETY LIGHTING AND REFLECTING EQUIPMENT

(CONTINUED FROM PAGE 94)

tried them in production on some of our passenger cars. However, so many of the commercial oils on the market at that time were so low in stability, that even with oil coolers, these oils oxidized and decomposed and plugged the oil coolers, putting them out of use. As a result, after several years trial, we discontinued oil coolers on passenger cars.

4. Another solution which has some advocates is very frequent draining of the crankcase oil. It is

obvious that if oil can be drained and replaced with fresh oil before it has had opportunity to oxidize or decompose, this would be a solution to the problem. However, some oils are so unstable that this solution of the problem might require such frequent draining of the oil as to be prohibitive in cost.

5. The solution which we believe is most satisfactory is the use of oils which are sufficiently resistant to oxidation and decomposition to withstand the temperatures to which they

are exposed in use in the engine.

The oil industry has made remarkable progress in the last few years in improving oils. Briefly these improvements come under three headings:

1. Refining methods which remove undesirable sludge forming materials from the oil.

2. Addition of oxidation inhibitors which greatly retard the rate of oxidation of the oil.

3. Addition of detergents which greatly reduce this formation of sludge and tend to prevent decomposition products in the used oil in the crankcase from sticking to the engine parts. This permits these decomposition products to remain suspended in the oil and to be removed from the engine when the crankcase is drained.

Now that we have discussed low temperature and high temperature sludges, their causes and effects, and how to avoid troubles from either or both of these types of sludges, the only remaining problem is, "How can the fleet operator be sure that he is using the right kind of oil?"

It would be a very simple solution of the problem if a vehicle manufacturer could specify the brand names of the oils that each of you should use, but we believe that this would not be a satisfactory solution for many obvious reasons. One reason is that it is the oil industry and not the automotive industry which manufactures and markets the oils. Another reason is that although high grade oils are desirable for all service, yet it is a fact that for mild operating conditions it may be possible to use cheaper oils in which these desirable properties have not been very highly developed. Another, and the most important reason, is because it would be a physical impossibility for any vehicle manufacturer to test all of the oils made by the various oil companies and to inspect the different shipments to see that they remained uniform. The final measure of quality of an oil is its performance in service, and the responsibility for a lubricant's quality and performance in service must remain with the oil company marketing the lubricant.

In considering this problem of grading oils it may be of interest to see how other similar problems have

(TURN TO PAGE 99, PLEASE)

HIGHWAY HAULAGE WITH AN EDWARDS IS A MONEY-MAKING OPERATION

THERE are two very good reasons for checking Edwards before you buy any trailer.

ONE is that Edwards lightweight steel construction cuts off all the excess deadweight it is practical to eliminate. That means you haul bigger payloads.

TWO is that Edwards sticks to tried and proved principles of trailer engineering. That means you save money when repairs are necessary.

Wide frames, straight end type springing, Timken tubular axles, full width pick up plate and more than 20 other features make Edwards a sound investment for profitable haulage. Investigate these Edwards trailers today.

EDWARDS HI-TENSILE STEEL SEMI-TRAILERS

EDWARDS IRON WORKS, INC., SOUTH BEND, IND.

ATTRACTIVE PROPOSITION FOR QUALIFIED DEALERS—WRITE OR WIRE

(CONTINUED FROM PAGE 96)

been solved in the past. According to Mark Twain, "Everybody talks about the weather but no one does anything about it." But for many thousands of years people were handicapped in talking about the weather for lack of thermometers to measure the temperature. The mercury thermometer was invented about 1650, but for many years there was no standardized scale or method of calibrating thermometers. They simply measured the amount by which the mercury expanded or contracted in the capillary tube, and since each thermometer was different one man might have said that the weather was terrible, his thermometer read 18 in., and another man might have said that he thought it was a rather nice day, his thermometer read only 11 in.

In 1714 Mr. Fahrenheit suggested that they adopt two reference points and divide the distance between these points into uniform spaces. For the low reference point Mr. Fahrenheit mixed ice and salt and he took the lowest temperature he could obtain as Zero. He then took the temperature of the human body as the high reference point and he divided the space between these points into 96 equal spaces, called degrees. It was not until after Fahrenheit's death that someone suggested the present reference points of freezing water and boiling water. These were about 32° and 212° on the Fahrenheit thermometer, and since it was recognized that these temperatures were more definite and reproducible, they have been our standards ever since.

This same fundamental principal of obtaining two reference points and then establishing a scale was applied to anti-knock values of gasoline. However, this very obvious method of grading gasoline was not developed over night. It was a gradual evolution, and it is interesting to note how the developments in lubricating oil and in grading lubricating oil parallel developments with gasoline.

In the early days, both gasoline and oil were graded by gravity. As new crudes and refining methods were developed, it was found that this system no longer was reliable and laboratory tests were then developed. With further developments in sources of crude and in refining methods

and in the use of addition agents, such as tetra-ethyl lead in gasoline, it was found that although these laboratory tests were valuable as a means of identifying a particular material and in checking refining processes, these laboratory tests were not a reliable indication of quality, and the system of testing the gasoline or oil by using it in an engine was adopted. Since it was found that, due to slight differences in the engines this system had its faults, the present system of comparing the

gasoline, under test with two reference fuels was adopted.

In a similar manner progress in grading lubricating oils is being made, but we have not quite progressed to the stage where we have an "octane" scale for lubricating oil. There are some complications in respect to establishing an "octane" scale for lubricating oil. This is shown diagrammatically in Figures 1 to 3 inclusive. If we had a "good" reference oil and a "bad" reference (TURN TO PAGE 100, PLEASE)

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#5607 Slawite DOOR LOCK

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MANUFACTURING CO.

Division of
The Eastern Malleable Iron Co.
CLEVELAND, OHIO

(CONTINUED FROM PAGE 99)

oil we could establish a very nice scale for lubricating oil by testing with oil in an engine in comparison with the "good" and the "bad" oil and with mixtures of these two oils.

The octane scale used in testing gasoline measures the anti-knock properties of a fuel, but unfortunately, a lubricating oil may be bad in several respects, as shown in Figure 2.

Although we may be able to

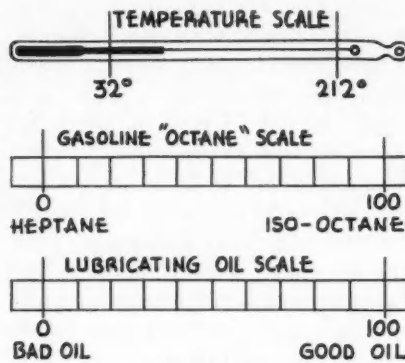


FIG-1

visualize a "good" reference oil, the "bad" oil may be subject to the formation of acid with little formation of sludge (such as oil A) or it may form sludge with little acid (such as oil B), or it may form both acid and sludge. Instead of a simple

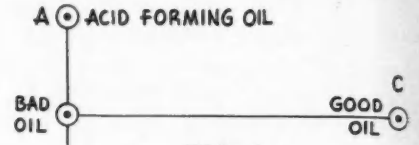


FIG-2

scale, based on a line drawn between two points, it appears that for grading oil we need a "map," such as that shown in figure 3.

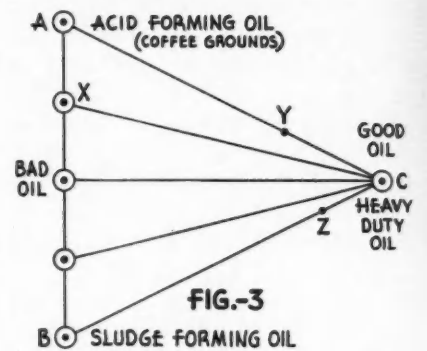


FIG-3

As an illustration of how oils of various properties might be compared, and how oils may be modified by the oil refiner, let us take, as an illustration, an oil with the properties of oil "B." This oil contains large amounts of material which no oxidation, under severe engine operating conditions, will form sludge. Such an oil will also probably contain natural oxidation inhibitors. Adding more oxidation inhibitor to such an oil will probably have little effect, but if the oil could be refined in such a manner that the sludge forming impurities were removed without removing the natural inhibitors, a much better oil, like oil "Z," would be produced. Unfortunately, the usual refining methods which might remove the sludge forming impurities would probably remove a large amount of the natural oxidation inhibitors as well, and as a result an oil like "X" would probably be produced. Such an oil might be very satisfactory for mild service but in severe service it would oxidize quite readily. In such a case the oxidation products would be acids and oil soluble resins that would later be converted into "coffee" (TURN TO PAGE 102, PLEASE)

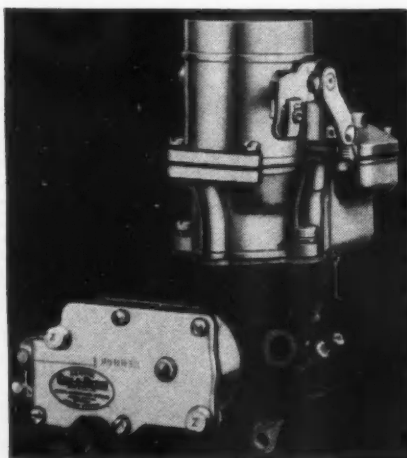


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Made of the finest case-hardened molybdenum steel . . . completely in **ONE PIECE**. There are no welded bars to break off. You not only get longer life, but full protection for the full life of the chain.

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Special discounts to fleet operators represent a definite saving in original investment over any other quality chains. The additional operating savings of long life and dependable operation during winter driving are bonuses that no fleet operator can afford to ignore.

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(CONTINUED FROM PAGE 100)
grounds." By adding an oxidation inhibitor to an oil like "X," it would be more resistant to oxidation and an oil like "Y" would result. By adding enough oxidation inhibitor and a detergent, a very excellent "heavy duty oil" like "C" might be produced.

It may be of interest to know that very much progress has already been made in oil testing, and that at the present time a large number of men in the various companies of the oil

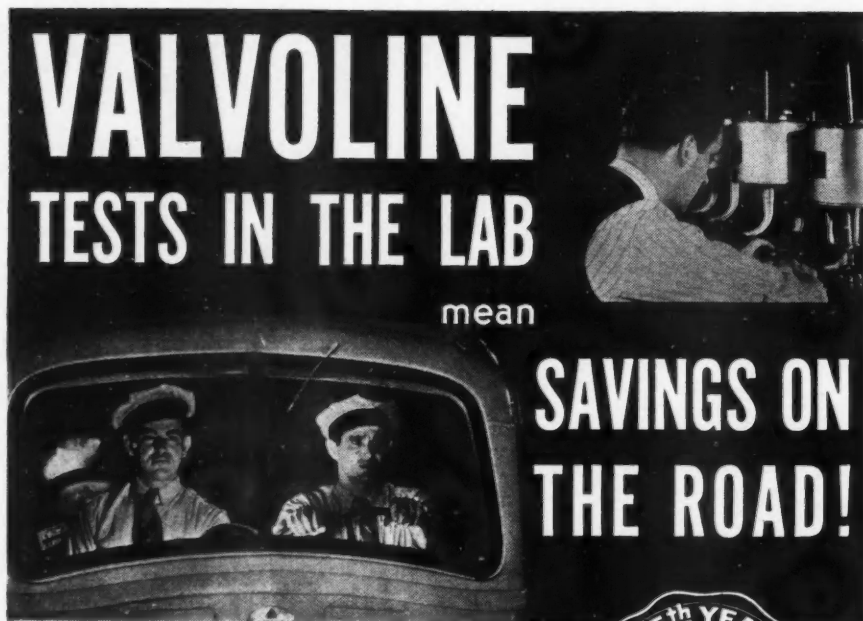
and automotive industry are making engine tests, using standardized engines and test procedures, and in many cases standardized reference oils are being used. Although an acceptable grading system for classifying lubricating oils has not been developed as yet, the oil industry has learned how to manufacture "heavy duty oils" that are very much like the theoretical oil "C." Although these oils cannot be graded by any recognized numerical scale, the oil and automotive industries are able to

recognize these oils by comparing them with reference oils in engines using standardized test procedures.

Practically all of the oil companies have these oils available, under the general classification of "heavy duty oils."

END

(Please resume your reading on p. 22)



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TESTS IN THE LAB

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SAVINGS ON THE ROAD!

Valvoline, first of the Pennsylvania oils, has helped hundreds of fleet operators to save money in daily operation and prevent costly tie-ups. When you ask for Valvoline Fleet Laboratory Service, we make a complete study of your fleet. This includes not only crankcase drainings, but fuel, equipment and operating conditions as well.

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Brake School

Last year the ICC made a report to the ATA regarding safety. Whereupon the safety advisory committee of the ATA and ICC officials got together and agreed that a school for mechanics on brakes and brake maintenance would be a good thing. The committee enlisted the aid of manufacturers. Bendix Products Div., Wagner Electric Corp., Midland Steel Products Corp. and Bendix-Westinghouse liked the idea and are cooperating to organize brake schools throughout the country. First, however, a "guinea pig" school will be conducted to iron out the wrinkles before anything is undertaken on a large scale.

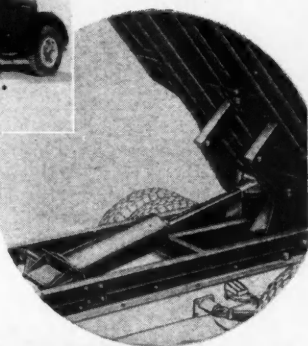
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Now every DESIRABLE MECHANICAL FEATURE so VITALLY NECESSARY for PROFITABLE DUMP TRUCK OPERATION is BUILT INTO EACH OF 9 SUPER HOIST SIZES. Whether you buy a 1½ yard or 20 yard dump body you get the advantages of all of these features . . .

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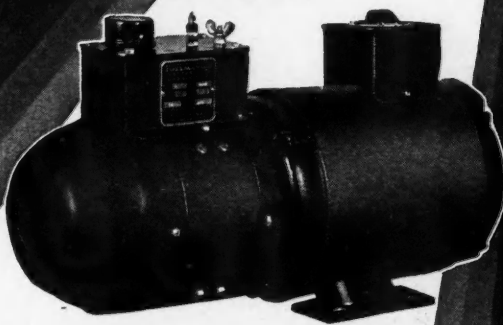
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FOREMAN *Announces* A NEW IMPROVED MOTOR-GENERATOR UNIT

ADVANTAGES ARE:

1. Motor and Generator rotate on same shaft.
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Resulting in Quiet Operation
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See your Jobber or write
us for details.

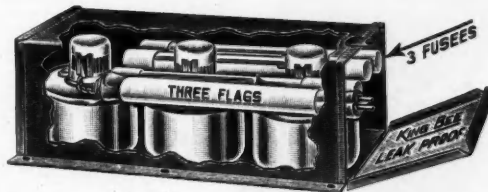


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King Bee offers 3 types of Flares—4 types of Fusees—4 types of Flags—5 different case mountings—and, in all, 44 different varieties of Flare Sets or Combinations.

Set shown may be any of the following, according to price range:

337-10	3 Ace Flares	3 Flags	3 Fusees
393-10	3 Fuel-Tite Flares	3 Flags	3 Fusees
373-10	3 Special Flares	3 Flags	3 Fusees

See your Jobber or write for complete information.

AMERICAN AUTOMATIC DEVICES CO.

Manufacturers of the Famous KING BEE Products

HARRISON THROOP AND CONGRESS STREETS

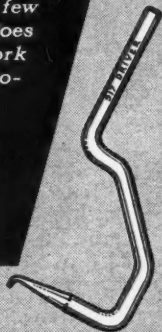
CHICAGO, ILL.



THE RIGHT TOOLS.

for pulling valve guide and spring assemblies from Ford Motors. 920 Set (shown) for V-8-85, Mercury, Lincoln-Zephyr and Tractor motors and 860 Set for V-8-60. No matter how tight the guides are stuck these husky sets (Puller above, Retainer Driver below) pull assemblies without fuss or delay. Jaw fits under guides and pressure cup rests on block around valve head. A few turns on the screw handle does the trick. If you do Ford work you should get these outfits today—ask your jobber.

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National Defense work will make WEED CHAINS more important this winter than ever before. Millions of workers will use bus transportation. Trucks will transport vital materials and supplies. There will be days when WEED CHAINS will do more than anything else to "Keep Them Rolling."

WEED AMERICAN BAR-REINFORCED TIRE CHAINS give more than double mileage. Greater traction and greater safety. The best buy in tire chains. Four sterling features: **1. Bar-reinforcements** on links give double the service. **2. Weed-alloy**—a stronger, tougher metal. **3. Patented Lever-Lock End Hooks**—easy to use and positive fastening. **4. Side Chains** welded and hardened to resist wear on curbs and ruts.

Order your WEED AMERICAN BAR-REINFORCED TIRE CHAINS now. Be prepared to keep running on schedule when snow comes.

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THE WISE MOTOR CARRIER will make preparations now to get the very last efficient mile out of his Truck-Trailers, because every Trailer now on the road, plus every one that can be built, will be needed directly or indirectly for the defense requirements.

IT'S GOOD BUSINESS FOR YOU

If your hauling equipment is to continue doing an efficient job (and that's the only kind that will help either you or the defense program), you have a special responsibility in maintaining it in the best operating condition. Engineers call this "preventive maintenance." Another equally good term for it is "good business!" If it's good business for you to maintain your equipment in top-notch operating condition in normal times, it's doubly so for the period of the emergency. Machines, like men, become fatigued and less efficient if worked beyond their usual requirements. In the case of Trailers, that means additional service attention . . . such as a frequent and regular checking of brake balance and brake linings . . . lubrication . . . wheel bearings . . . wheel alignment . . . tire condition, etc. Preventive maintenance requires, also, that the Trailer body be kept in efficient order.

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As our contribution toward keeping your Trailers running more efficiently and longer, we are still further improving our nation-wide service facilities. You can get top-notch service at the more than sixty strategically located Fruehauf Branches. These in turn, are backed by added facilities at the factory, where more than 12,000 parts are stocked and a new parts manufacturing division has been established. No other Trailer manufacturer provides this nation-wide service!

Just as it's wise to see your dentist regularly, or to have your automobile checked every 2,000 miles, so it is wise to check your Truck-Trailer equipment regularly. You may add years to its life.

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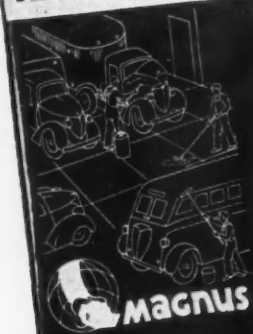
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THE experience of Trailer users is that their maintenance costs are less if they buy Fruehaufs . . . because buying the best is insurance for the future . . . insurance against costly delays, big repair bills, interruption of service. But when service attention is necessary (and it is sometimes necessary with anything mechanical) Fruehauf service facilities are a further insurance against costly delays and attendant expense.

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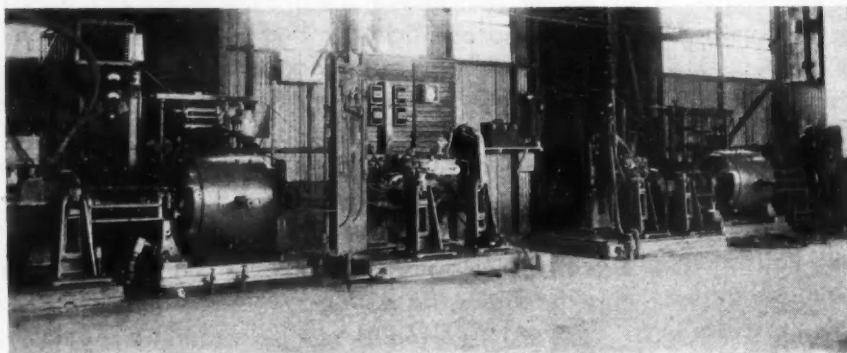
Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emulsifying Agents and Metal Working Lubricants.

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(CONTINUED FROM PAGE 132)

wheels, hubs, drums, starting apparatus, spring suspension, brackets and shackles; gages, speedometers, motors, fuses, flares, directional signals, rear-view mirrors, windshield wipers, control mechanism, steering apparatus, driving gears, coupling devices; also the exhaust, cooling, fuel and electrical systems, including generators, lights, reflectors and batteries; and, but only as to parts for passenger carriers, heating, ventilating and door-opening equipment.

(3) "Supplier" means any person with whom a contract or purchase order has been placed for delivery, to the Producer or to another Supplier, of Material which will be physically incorporated into the Defense Products.

(4) "Material" means any commodity, equipment, accessories, parts, assemblies or products of any kind.

(b) *Assignment of Preference Rating.* Subject to the terms of this Order preference rating A-3 is hereby assigned:

(1) to deliveries to a Producer by his suppliers of Materials required for the production by him of Defense Products, provided, however, that when his production of the Defense Products is limited by Limitation Order No. L-1-a, or by any other order or direction of the Director of Priorities, no materials shall be obtained in quantity greater than required for his production as so limited.

(2) to deliveries to any Supplier of Material which he requires to make his rated deliveries to the Producer or to another Supplier, provided, such material will be physically incorporated in the Defense Products.

(c) *Persons Entitled to Apply Preference Rating.* The Preference Rating hereby assigned may be applied by

(1) a Producer;

(2) a Supplier, provided that he requires the Material so purchased in order to make deliveries which have been duly rated in the manner specified in paragraph (d).

(d) *Application of Preference Rating.*

(1) A Producer in order to apply the preference rating to a delivery of material to him must endorse the following statement on the original and all copies of the purchase order or contract for such Material, signed by a responsible official duly designated for such purpose by such Producer.

**CERTIFICATE OF PRODUCER APPLYING
RATING**

An A-3 preference rating is assigned to this purchase order pursuant to Limited Preference Rating Order P-54. This application of the rating is made by the Producer upon the conditions set forth in said Order, with which we are familiar.

Authorized Signature for Producer

Such endorsement shall constitute a certification to the Office of Production Management that such Material is required to the extent ordered in order to produce the number of Defense Products within the limits authorized.

(2) A Supplier in order to apply the preference rating to a delivery of Material to him must endorse the following statement on the original and all copies of the purchase order or contract for such Material signed by a responsible official duly

designated for such purpose by such Supplier:

CERTIFICATE OF SUPPLIER APPLYING RATING

An A-3 preference rating is assigned to this purchase order pursuant to Limited Preference Rating Order P-54. This application of the rating is made by the Supplier upon the conditions set forth in said Order, with which we are familiar.

Authorized Signature for Supplier

Such endorsement shall constitute a certification to the Office of Production Management that such Material is required to the extent ordered in order to fill a purchase order placed by a Producer or Supplier duly rated in accordance herewith. Any such Supplier's purchase order or contract shall be restricted to Material the delivery of which is rated in accordance herewith.

(3) A Producer or Supplier placing any such rated purchase orders or contracts and the Supplier selling the Material covered thereby, must each retain endorsed copies of such purchase orders or contracts segregated from all other purchase orders or contracts for a period of two years from the date thereof for inspection by authorized representatives of the Office of Production Management.

(e) *Restrictions on Application of Rating.* The preference rating hereby assigned shall not be applied:

(1) *by a Producer* to obtain deliveries of Materials in excess of the amount needed for the production of the Defense Products, taking into consideration existing inventories of the Producer, and subject to any limitation contained in Limitation Order L-1-a, or in any other Order or direction issued by the Director of Priorities. If a Producer has sufficient Material to produce the authorized number of Defense Products and still have a practicable minimum working inventory, he shall not make use of the rating to obtain delivery of such Material.

(2) *by a Supplier* to obtain Material in excess of the amount necessary to make rated deliveries, taking into consideration existing inventories of the Supplier. If a Supplier has sufficient Material to enable him to make his rated deliveries and still have a practicable minimum working inventory, he shall not make use of the rating to obtain delivery of such Materials.

(3) *by a Producer or a Supplier.*

(i) unless the Material to be delivered cannot be obtained when required without such rating,

(ii) to obtain deliveries earlier than required,

(iii) to deliveries of Materials on purchase orders placed after Nov. 1, 1941,

(iv) to deliveries of Materials on purchase orders calling for delivery after Nov. 30, 1941.

(f) *False Statements and Penalties.* Any person who applies the preference rating hereby assigned in wilful violation of the terms and provisions of this Order, or wilfully falsifies records required to be kept or information to be furnished pursuant to this Order, or who obtains a delivery of Material by means of a material and wilful misstatement will be prohibited

(TURN TO PAGE 136, PLEASE)

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LONGER WEAR EASIER TO APPLY EXTRA TRACTION

McKay Truck Chains have what it takes to keep the payloads moving, regardless of weather conditions... and do it at the lowest cost per mile! It's good business to inspect the chains on every truck, and replace defective equipment with McKays. Write for nearest jobber's name!

ONLY McKAY OFFERS:

- 1 **MULTI-GRIP**... the double-bar reinforced tire chain that gives double safety and double mileage.
- 2 **KLIP-LOCK FASTENER**... the quick, simple, exclusive fastener that makes McKay Chains "Easy to Put On."
- 3 **SUPERIOR CASE-HARDENING**... which makes McKays "Hard to Wear Out."... gives supreme long-wear.

Don't forget McKay "REGULAR" Chains — for every advantage except the bar-reinforced feature.

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For Example:

SPEEDING-UP REPAIR WORK IN THE BUSY MONTHS AHEAD!

Authorities say that curtailment in automotive production means more trucks will be used longer . . . MORE service and repair work will be needed to maintain fleet units in good operating condition.

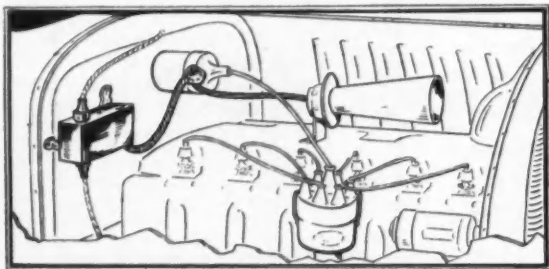
Let Oakite cleaning HELP YOU do this FASTER and EASIER! Whether you use hot or cold solutions in tank or pressure-spray equipment, we are ready to demonstrate that Oakite materials can handle ALL your maintenance cleaning requirements on a SPEEDY, efficient, low-cost basis day-after-day. Write today for FREE 36-page booklet giving complete details.

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Representatives in all Principal Cities of the U. S. and Canada



"I want to report an accident!"
Of all the words in any language, these are guaranteed to give a fleet operator nightmares.

SAFETY SPEED VEHICLE CONTROL WILL DISPEL THOSE FEARS



Far more than just a handful of words, SAFETY SPEED VEHICLE CONTROL stands for safety, efficiency and economy in performance of light trucks and delivery units. Driven by the speedometer cable and operating electrically in conjunction with the ignition system, SAFETY SPEED VEHICLE

CONTROL provides an efficient curb on excessive speed without any accompanying loss of power. With the control set for a maximum speed of 40 MPH, the vehicle operates normally, with no restriction on intermediate speeds, until the speed of 41 MPH is attained. At this point the horn sounds a warning. If 41 MPH is exceeded, the SAFETY SPEED VEHICLE CONTROL cuts in and reduces speed to a point below maximum. Travel is resumed by use of the accelerator.

Another feature is the economical installation time, for most units, of less than one hour.

Ask for details on SAFETY SPEED MOTOR CONTROL for large trucks.

SAFETY SPEED CONTROL COMPANY
4242 W. Chicago Avenue, CHICAGO, ILL.

(CONTINUED FROM PAGE 135)

from obtaining further deliveries of Material under allocation and be deprived of any other priorities assistance. The Director of Priorities may also take any other action deemed appropriate, including the making of a recommendation for prosecution under Section 35A of the Criminal Code (18 U.S.C. 80).

(g) *Reports.* Each Producer and Supplier who in any month applies the preference rating in the manner herein provided to any deliveries to him, shall, on or before the fifth day of the following month file with the Automotive Branch, Civilian Supply Division, Office of Production Management, Washington, D. C., a report on form to be prescribed by the Director of Priorities, setting forth the number of items or amount of Materials to which the preference rating has been assigned in the preceding month, the stock of such items and amount of such materials on hand, and the number or amount used in production by him during the period from Jan. 1 through June 30, 1941; and such other reports as the Director of Priorities may require.

(h) *Revocation or Modification.* This Order may be revoked or amended by the Director of Priorities at any time in whole or in part or in its application to any Producer or any Supplier. In the event of revocation, or upon expiration of this Order, deliveries already rated pursuant to this Order shall be completed in accordance with said rating, unless the rating has been specifically revoked. No additional applications of this rating to any other deliveries shall thereafter be made by any Producer or Supplier affected by said revocation or expiration.

(i) *Effective Date.* This Order shall take effect on the 12th day of September, 1941, and unless sooner revoked shall expire on the 30th day of November, 1941. (P.D. Reg. 1, Aug. 27, 1941, 6 F.R. 4489; OPM Reg. 3, March 8, 1941, 6 F.R. 1596; E.O. 8629, Jan. 7, 1941, 6 F.R. 191; E.O. 8875, Aug. 28, 1941, 6 F.R. 4483; sec. 2(a), Public No. 671, 76th Congress, Third Session, as amended by Public No. 89, 77th Congress, First Session; sec. 9, Public No. 783, 76th Congress, Third Session.) Issued the 12th day of September, 1941.

(Signed) Donald M. Nelson
Director of Priorities

TITLE 32—NATIONAL DEFENSE CHAPTER IX—OFFICE OF PRODUCTION MANAGEMENT

Subchapter B—PRIORITIES DIVISION
Part 958—REPAIRS

PREFERENCE RATING ORDER NO. P-22

958.1 PREFERENCE RATING ORDER.

For the purpose of facilitating the acquisition of Material for the Repair of the property or equipment of certain industries and services hereinafter specified, a preference rating is hereby assigned to deliveries of Material for such purpose upon the following terms:

(a) *Definitions.*

(1) "Producer" means any individual, partnership, association, corporation, governmental unit, or other organization engaged in one or more of the following industries and services, and such other indus-

tries and services as may be added from time to time by supplement to this Order:

(i) The following Federal, State, County, and municipal services: Fire and police services; Highway maintenance.

(ii) Carriers:

(a) Urban, suburban, interurban, and intercity common, contract, and private carriers of passengers or freight by electric railway, electric coach, motor truck, or bus, including terminals.

(b) Railroads, including terminals.

(c) Shipping—Commercial carriers of freight and passengers by ocean, lake, river, or canal, including terminals.

(iii) Chemicals—Plants engaged in producing chemicals by chemical processing of raw materials.

(iv) Coke converting.

(v) Educational institutions (including vocational training).

(vi) Explosives—plants engaged in manufacturing explosives.

(vii) Farm machinery and equipment—plants engaged in manufacturing farm machinery and equipment.

(viii) Food processing or storing—plants engaged in any of the following: milling, refining, preserving, refrigerating, wholesaling or storing of food for human consumption or livestock feed.

(ix) Highway maintenance and equipment—plants engaged in the production of equipment used in highway maintenance.

(x) Hospitals, clinics and sanatoriums.

(xi) Lumber—plants engaged in the production of lumber (including planing, drying, storing, and treating of lumber), cooperage, plywood, and millwork.

(xii) Metallurgy—plants engaged in the production of metals and alloys.

(xiii) Mines and quarries (including ore dressing or processing plants and smelting facilities).

(xiv) Newspapers—plants engaged in the publication of newspapers.

(xv) Petroleum production, refining and transportation—plants and equipment used in petroleum production, refining and transportation.

(xvi) Radio—Commercial broadcasting and communication (not including home receiving sets).

(xvii) Research laboratories—industrial and academic.

(xviii) Rubber and rubber products—



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plants engaged in the production of rubber and rubber products including reclaimed and synthetic rubber.

(xix) Shipyards and Ship Repair Yards engaged in building and repairing ships (excluding yards devoted principally to pleasure craft).

(xx) Telephone and telegraph communication.

(2) "Material" means any commodity, equipment, accessories, parts, assemblies, or products of any kind.

(3) "Repairs" means only repairs needed because of an actual or imminent breakdown from whatever cause, of a Producer's property or equipment.

(4) "Emergency Inventory" means minimum inventory of Material required to provide for Repairs to meet an actual or im-

minent breakdown, from whatever cause, of a Producer's property or equipment.

(5) "Supplier" means any person with whom a purchase order or contract has been placed by a Producer or any Supplier for

(i) Material to be used for Repairs;

(ii) Material required for a Producer's Emergency Inventory;

(iii) Material to be physically incorporated in other Material which is to be used for Repairs or which is required for a Producer's Emergency Inventory.

(b) *Assignment of Preference Rating.* Subject to the terms of this Order, Preference Rating A-10 is hereby assigned

(1) To deliveries to a Producer of Material required by him for Repairs or for his
(TURN TO PAGE 138, PLEASE)



Keep 'em rolling for less—

ONE GREASER WITH ONE GREASE RACK DOES THE WORK OF FIVE

SIMPLEX GREASE CUPS

grease shackles, spindles, etc., for 5,000 miles on one filling. Grease entering the filling nipple under pressure, compresses the air in the neoprene ball, causing a slow continuous flow of lubricant to the bearing surfaces for 5,000 miles in one filling.

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"Hydraulic Emergency Brake"

stops and holds your trucks, up hill or down hill, in one operation. Quick, positive 4 or 6 wheel action. Instant release, controlled manually on dashboard by driver. On or off at his option.

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AHLBERG BEARING COMPANY
Manufacturers of (CJB) Master Ball Bearings
3006 WEST 47TH STREET, CHICAGO

(CONTINUED FROM PAGE 137)

Emergency Inventory;

(2) To deliveries to a Supplier of Material which is, in turn, to be delivered to a Producer for Repairs or for his Emergency Inventory or to be physically incorporated in Material to be so delivered.

(c) *Persons Entitled to Apply Preference Rating.* The preference rating hereby assigned may be applied by

(1) a Producer;

(2) a Supplier, provided that he requires the Material so purchased in order to make deliveries duly rated pursuant to paragraph (b).

(d) *Application of Preference Rating.*

(1) A Producer in order to apply the preference rating to a delivery of material to him must endorse the following statement on the original and all copies of the purchase order or contract for such Material signed by a responsible official duly designated for such purpose by such Producer.

"Purchase Order for Repair or Emergency Inventory-Preference Rating A-10 under Preference Rating Order P-22."

Such endorsement shall constitute a certification to the Office of Production Management that such Material is required for the purposes stated therein. Any such purchase order or contract shall be restricted to material the delivery of which is rated in accordance herewith.

(2) A Supplier in order to apply the preference rating to a delivery of Material to him must endorse the following statement on the original and all copies of the purchase order or contract for such Material signed by a responsible official duly designated for such purpose by such Supplier:

"Purchase Order for Material required to fill a duly rated order for Repair or Emergency Inventory. This purchase order bears Preference Rating A-10 under Preference Rating Order P-22."

Such endorsement shall constitute a certification to the Office of Production Management that such Material is required to fill an order placed by a Producer or Supplier duly rated in accordance herewith. Any such Supplier's purchase order or contract shall be restricted to Material the delivery of which is rated in accordance herewith.

(3) A Producer or Supplier placing any such rated purchase orders or contracts and the Supplier selling the Material covered thereby, must each retain endorsed copies of such purchase orders or contracts segregated from all other purchase orders or contracts for a period of two years from the date thereof for inspection by authorized representatives of the Office of Production Management.

(e) *Restrictions on Application of Rating.* The Preference Rating hereby assigned shall not be applied

(1) by a Producer to obtain Material in excess of his requirements for Repairs or for his Emergency Inventory;

(2) unless the Material to be delivered cannot be obtained when required without such rating;

(3) by a Supplier to obtain Material in excess of the amount necessary to make rated deliveries.

(Continued on next page)



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TRADE MARK REG.

BATTERIES

built for REPLACEMENT SERVICE
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Developed by MEEHANITE RESEARCH INSTITUTE Pittsburgh Pa. in cooperation with GENERAL FOUNDRY & MANUFACTURING CO. Flint Mich.

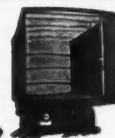
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ATLAS Collapsible GATE

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Heavy galvanized wire suspended from rings which slide on a round track. "Chain Link" weave as is used in best quality fence. Protects against theft and loss. Easy to open and close. Weave collapses within itself, saving space. Rigidly made for long, hard service, yet it is so light in total weight that average gate weighs only 90 lbs. Easily installed by owner's men. Satisfaction guaranteed. Quantity Discounts—Distributors Wanted.

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(f) *False Statements and Penalties.* Any person who applies the preference rating hereby assigned in wilful violation of the terms and provisions of this Order, or wilfully falsifies records required to be kept or information to be furnished pursuant to this Order, or who obtains a delivery of Material by means of a material and wilful misstatement will be prohibited from further applying said rating. Such person may also be prohibited from obtaining further deliveries of Material under allocation and be deprived of any other priorities assistance. The Director of Priorities may also take any other action deemed appropriate, including the making of a recommendation for prosecution under Section 35A of the Criminal Code (18 U.S.C. 80).

(g) *Revocation or Modification.* This Order may be revoked or amended by the Director of Priorities at any time in whole or in part or in its application to any Producer or any Supplier. In the event of revocation, or upon expiration of this Order, deliveries already rated pursuant to this Order shall be completed in accordance with said rating, unless the rating has been specifically revoked. No additional applications of this rating to any other deliveries shall thereafter be made by any Producer or Supplier affected by said revocation or expiration.

(h) *Effective Date.* This Order shall take effect on the 9th day of September, 1941, and unless sooner revoked shall expire on the 28th day of February, 1942.

(P.D. Reg. 1, Aug. 27, 1941, 6 F.R. 4489; O. P. M. Reg. 3, March 8, 1941, 6 F.R. 1596; E. O. 9629, Jan. 7, 1941, 6 F.R. 191; E. O. 8629, Aug. 28, 1941 6 F. R. 4483; sec. 2(a), Public No. 671, 76th Congress, Third Session, as amended by Public No. 89, 77th Congress, First Session; Sec. 9, Public No. 783, 76th Congress, Third Session.)

DONALD M. NELSON,
Director of Priorities.

END

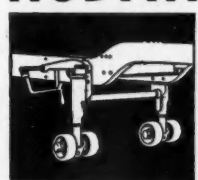
(Please resume your reading on p. 36)

Books

A handbook on welding electrodes and accessories may be obtained free for the asking from Hobart Bros. Co., Troy, N. Y.

Oakite Products, Inc., New York City, offers a 20-page data manual on handling truck cleaning jobs with cold solutions. It's free—just write for it.

AUSTIN



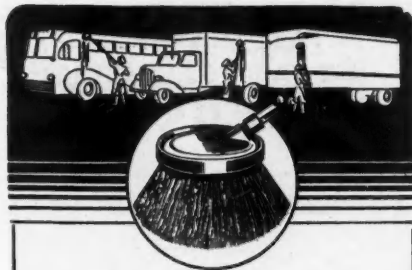
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**HORIZONTAL,
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Beaurline Fountain BRUSHES

Used and recommended by leading Fleet Operators for over 12 years! Simple design with exchangeable head. Imported Russian and Chinese bristles are set solid in bakelite and flare out to 10-inch diameter at bottom. Speed up your washings and lower your expenses with Beaurline Brushes.

Ask the man on your wash-rack he'll tell you imitations can't compare with Beaurline Brushes for quality, length of service and low cost and upkeep!

BRUSH ASSEMBLY—\$10.95
(Handle, 20¢ per foot)

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**Here's How You
Can Reduce Your
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Specify

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Signals

THE TELEOPTIC CO.
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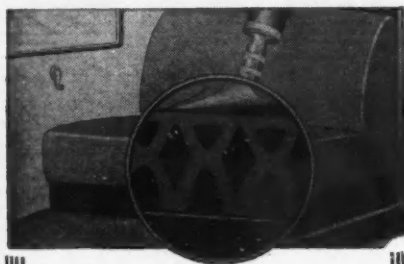
AUTOCAR TRUCKS

SHORT-WHEELBASE
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GASOLINE OR
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IN ALL
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USE KARPEX ALL-RUBBER
SEAT CUSHIONS**



One fleet operator says "They wear like iron," another "They cut costs." These are facts from operators like yourself. They believe that you, too, can profit handsomely by installing Karplex Black Diamond special processed semi-sponge rubber seat cushions and back rests that guarantee extra long life and eliminate upkeep expense. The secret's in the new improved diamond grid construction with its bulldog stamina. Fit any truck. Send seat specifications for prices.

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Both "V" TYPE and
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hand or power hydraulic control
FOR ALL MOTOR TRUCKS
FROM 1½ to 10 TONS

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It Costs No More for Trucks Specially
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**COVER 70% OF ALL
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ZOLLNER EQUIPPED**

ZOLLNER
HEAVY DUTY PISTONS
ZOLLNER MACHINE WORKS FORT WAYNE, IND.

ALGER STORY

(CONTINUED FROM PAGE 39)

entered on the correct line. The various maintenance jobs are listed in the following order in the ledger:

1. Change or overhaul engine; adjust valves or tappets; grind valves; replace head or gasket; install new rings; adjust rod bearings; install new rods.

2. Radiator or cooling repairs; clutch adjustment or repair; new clutch lining; new pressure plate.

3. Clutch adjustment or repair.

4. Transmission repairs; transmission replaced.

5. Differential repairs; differential replaced.

6. Driveshaft and universal; fuel system cleaned; pump replaced; carburetor and lines repaired; carburetor replaced; gas tank repaired.

7. Electrical inspection; plugs checked or cleaned; distributor repaired; generator repaired; light wiring repaired.

8. Water pump and fan belt.

9. Diesel injector adjustment; injectors replaced; brakes adjusted; brakes relined; brake drums changed.

10. Wheel bearings adjusted and greased; frame repairs; cab and glass work; battery changed.

11. Exhaust manifold and pipe repaired.

12. Power brake lines repaired; spring repairs; oil lines repaired or cleaned.

By looking at the entries in the ledger, the shop bookkeeper can tell if a truck is undergoing too many repairs for a particular item. An excess of dates entered on the line for that operation will indicate that the work or part is faulty and means must be taken to correct it. If there are no entries for a particular operation, such as cleaning plugs or fuel system, and a look at the mileage indicates the work should be done, an order is put through to do it the next time the truck comes off the road.

The ledger cross checks with the Repairs Work Orders which are filled out by the mechanic whenever he does a repair job. He details the work done and the start and finish time of the operation on the face of the card. On the reverse side he lists materials used. These cards then go to the shop office, where the date of the particular operation is entered in the ledger.

— Oldforge —

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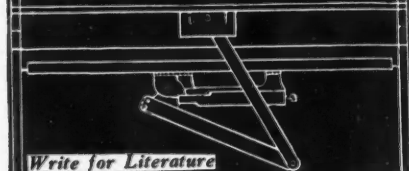


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Write for Complete Line Catalogue

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*AVOID GLASS BREAKAGE AND
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The smartest, most improved unit of its type, Model V-400 Vertical Lift Landing Gear is especially adapted for heavy duty service.

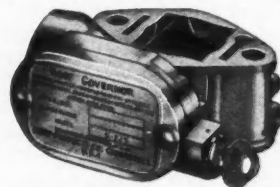
Powerful—rugged—dependable.

Complete truck and trailer equipment.
Catalog on request.

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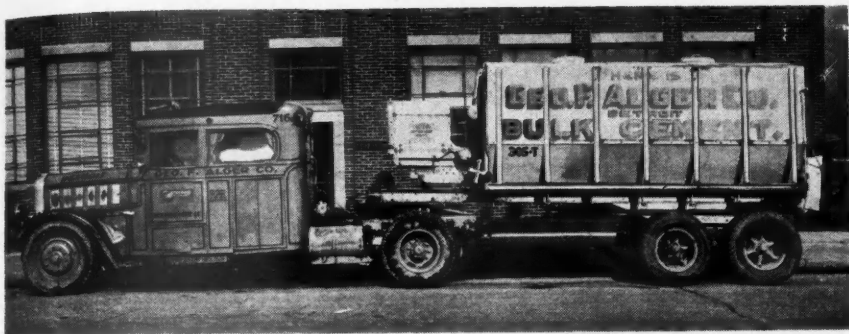
FULL ENGINE POWER and ACCELERATION
COMPACT — NEW FEATURES — TAMPER PROOF

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6543 S. Laramie Ave., CHICAGO, ILL.

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This heavy Alger semi-trailer unit is kept rolling every working day—thanks to the exacting preventive maintenance program in operation

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Permalux "KOLORFILM"

PERMALUX "KOLORFILM" decals offer greater durability and economy in application and maintenance. Completely synchronous with modern truck finish, they last longer . . . look better!

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CUSTOM-BUILT SETS
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Safe — dependable — complete line for
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Hoists — Bodies — Tanks — Road Scrapers — Snow Plows
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COLLAPSIBLE GATES

Safe . . . easy and simple to handle. Zehr Chain Link Gates are all-welded steel designed for great strength and long continuous service. They are theft-proof, rustproof and flexible.

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ZEHR PRODUCTS COMPANY
2130 East Hazzard Street • Philadelphia, Pa.

Then the work cards are filed by truck numbers. If a truck continually has trouble with brake linings, or some other item, the work cards are referred to and the mechanic who last did the job is called in and an effort made to discover the cause of the excessive repairs.

A daily repair from the lubrication men, listing oil changes, oil added and filter changes is given to the shop office. No hard and fast rule is used on oil changes, this being left to the discretion of the lubrication men. They change the oil whenever necessary, depending upon the condition of the oil after a look at the dipstick. It is necessary to change oil oftener in winter due to greater condensation. Samples of oil are taken from time to time and sent to a testing laboratory to test for viscosity, carbon residue and acidity.

For their records, the lubrication men keep a blackboard listing all the trucks. Whenever a truck is serviced, the date is chalked up beside the truck's number. Trucks are greased after every trip. A record of the wheel-bearing adjustment and greasing is kept in the repair ledger. The shop office also keeps a card file of the oil added between fills. If a truck is using too much oil, it is inspected with the view to a needed

(TURN TO PAGE 142, PLEASE)

THERE'S ONLY
1

BURN-OUT PROOF
DIRECTIONAL SIGNAL SWITCH

In complete sets of Signal-Stats or as a replacement switch—ASK YOUR JOBBER

SIGNAL-STAT CORPORATION
68 JAY STREET BROOKLYN, N. Y.



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. . . The self-locking nuts that hold tight under all conditions of vibration and hard service. Test them on your troublesome fastenings.

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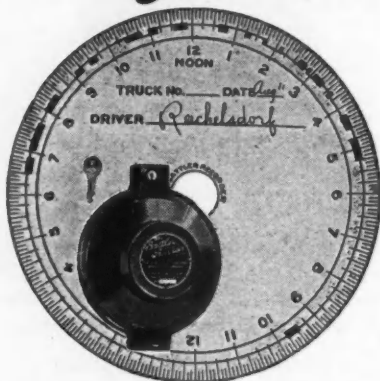
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CORPORATION**

Michigan City, Ind.



(CONTINUED FROM PAGE 141)

overhaul. All oil is reclaimed with the latest type of equipment and the reclaimed oil is used for make-up between drains.

The company operates a public gasoline service station on its property, one pump of which is devoted exclusively to Alger and Kirk trucks. This station pumps 100,000 gallons per month, the profit helping to carry the overhead of pump maintenance. A daily report of the gasoline pumped into each truck is turned in to the shop office.

Spot checks of gasoline consumption on certain trucks are made from time to time at the discretion of the shop superintendent. Par for the distance over which the truck operates is determined by previous experience, taking into account the load and type of work. An average of the same trucks in the same type of work on a monthly basis is used as a comparison. Spot checks are made more on the newer drivers or when the gas consumption of a particular truck begins to run too high. Speedometers are used to ascertain speed only and not to check fuel consumption.

Twenty of the 125 Alger tractor units are diesel-powered. One mechanic is a diesel specialist, having had eight years' experience in the field. Accurate regulation of the fuel injection system keeps smoking at a minimum on Alger trucks.

Brakes are given a routine check after every trip. Wheels are removed every six months, at which time bearings are greased and brake linings inspected. The six-month period was derived from experience. Its value was shown by the fact that in a three-month period there were only three bearing failures.

A check-up of ignition and electrical systems is made every 1500 to 2000 miles. The ignition specialists keep a blackboard in the shop upon which they enter the mileage and the date of this inspection for each truck. The electrical inspection consists of checking the battery, lamps, ignition points, generator and voltage regulator. A laboratory test set, with vacuum gages, tachometers and ammeters, also is employed.

Two men specialize in tires. A serial number is electrically branded on each new tire. A record of the date it is placed in service and the wheel of the truck on which it is used

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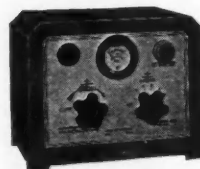
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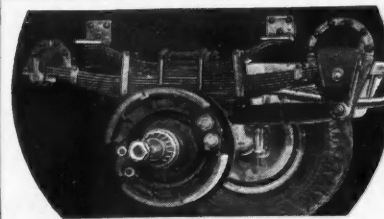
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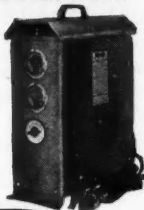
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is kept in the tire ledger in the shop office. New tires are placed first on the tractor units and shifted back to the trailers as they begin to wear. Tires are checked constantly for wear and when they become dangerous—too smooth, lacking tread or showing the thread—they are replaced. There is no retreading or recapping of tires. A stock of spare tires, ranging from seven to 20 in number, is kept at each check point. This obviates the necessity of carrying a spare. When a tire goes flat, the driver calls the nearest check point and a repair car brings out the necessary spare and the equipment to change it.

Drivers check tires for inflation every 50 or 60 miles on the road at the regular check stations. If the tires are overinflated, the drivers are instructed to wait until the tires cool rather than "bleed" them. The shop tire specialists also check all units after each trip. Tire changes are made at the most convenient time, which generally is from Friday night to Monday morning, when the trucks are out of service. Seventy-five per cent of tire changes are made in the shop over the weekend period. In the summer, tires are the main reason for service calls, which average 25 per month.

A caster and camber gage is used to test wheel alignment at the time tires are checked. Any necessary frame straightening is done in the shop, but axle straightening is farmed out.

The outward appearance of the trucks is maintained by the drivers, who are paid extra to keep the equipment clean. Minor touch-up work on paint is done in the shop, but major repaint jobs are farmed out.

In the present defense emergency, Alger is maintaining an adequate supply of all spare parts to guard against any contingency.

END

(Please resume your reading on p. 40)

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